March 15, 1948

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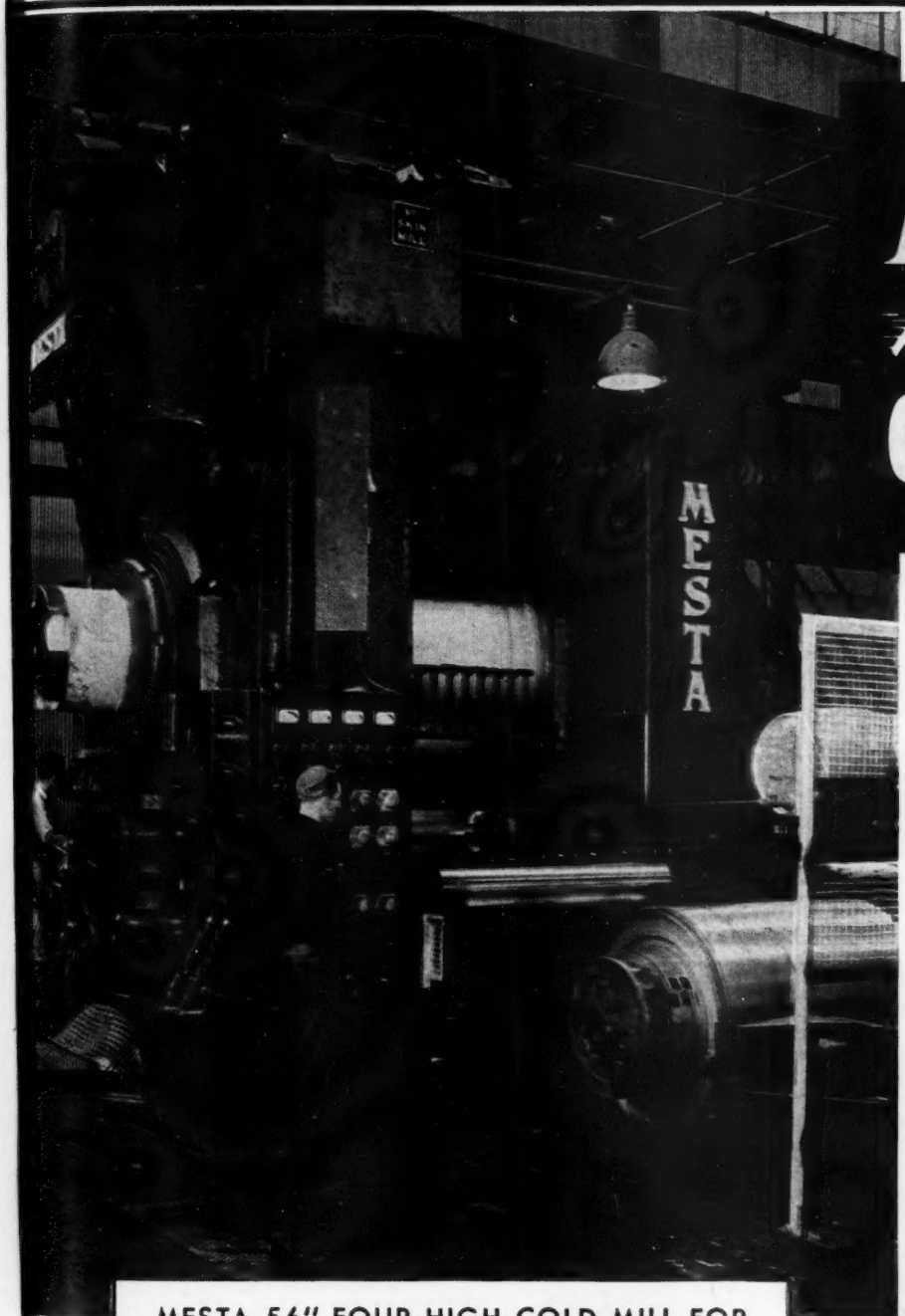
# STEEL

The Magazine of Metalworking and Metalproducing

ESTABLISHED 1882

EDITORIAL INDEX, PAGE 53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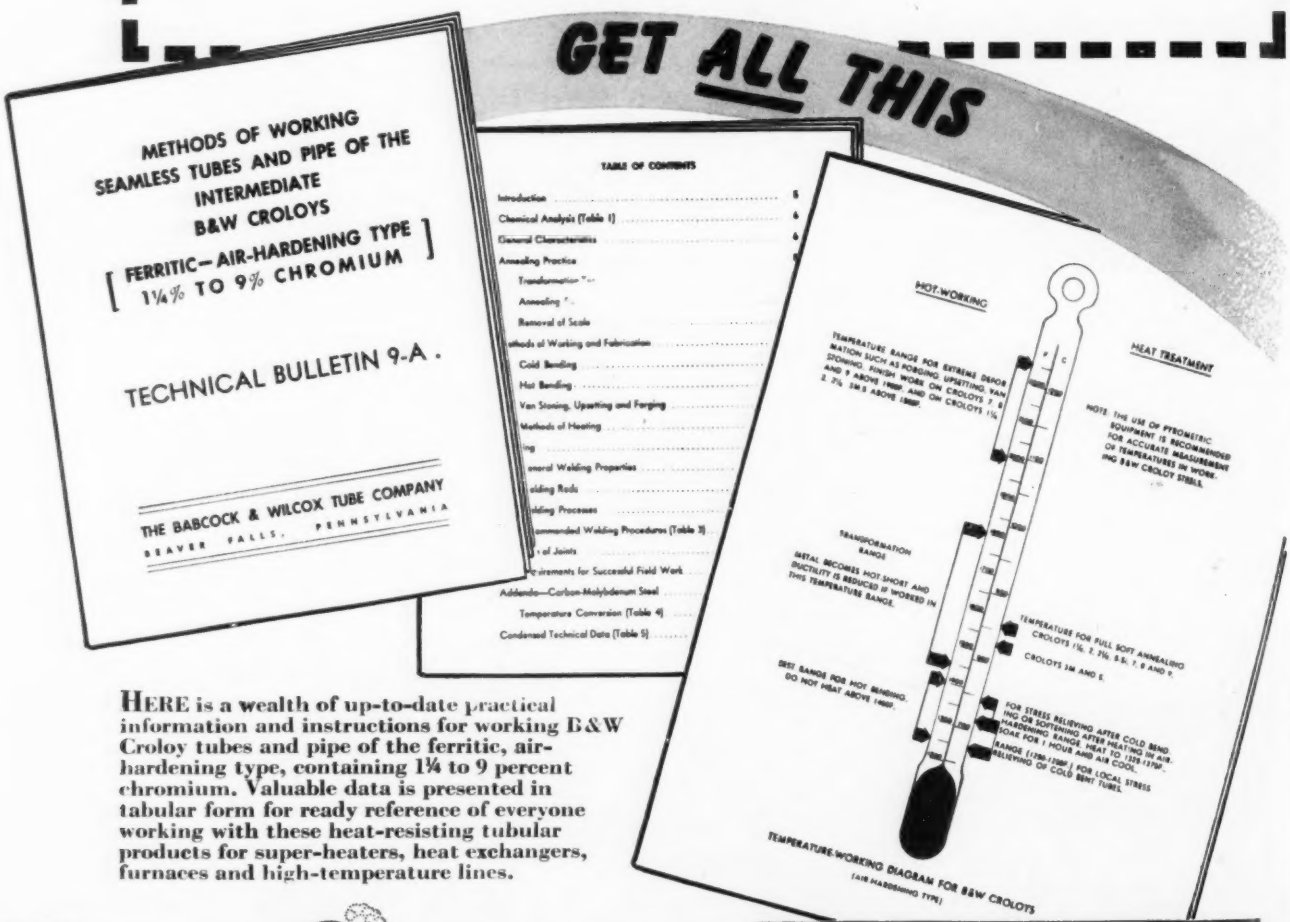
METHODS OF WORKING SEAMLESS TUBES AND PIPE OF THE INTERMEDIATE B&W CROLOYS
[ FERRITIC—AIR-HARDENING TYPE 1¼% TO 9% CHROMIUM ]
TECHNICAL BULLETIN 9-A .
THE BABCOCK & WILCOX TUBE COMPANY
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TABLE OF CONTENTS
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*Business Staff on Page 4*

**NEXT WEEK . . .**

**Quenching and Tempering Oils**

**Carbon Steel Spot Welding**

**Injuries in Ground Surfaces**

**Coke Facilities Enlarged**


# STEEL

*The Magazine of Metalworking and Metalproducing*

VOL. 122, NO. 11 MARCH 15, 1948


## NEWS


★ As the Editor Views the News ..... 55
★ News Summary ..... 59
Raw Materials Supply Plagues Steel Producers ..... 61
Mission Finds Huge German Scrap Piles ..... 62
U. S. Pushes Mobilization Preparations ..... 63
★ Present, Past and Pending ..... 63
Labor Supply Is Increasing on West Coast ..... 64
Urges Europe Get Surplus Tools ..... 65
Allocation Procedure Charted ..... 66
FTC Secures Steel Price Data ..... 67
★ Windows of Washington ..... 68
Westinghouse Machine Tool Forum Planned ..... 71
★ Calendar of Meetings ..... 71
Bizonia's Steel Output To Go Up ..... 72
European Co-operation Increases ..... 73
★ Mirrors of Motordom ..... 75
Building Costs Hit Allegheny Ludlum Corp. ..... 78
★ Briefs ..... 79
★ The Business Trend ..... 80
★ Men of Industry ..... 82
★ Obituaries ..... 87
★ Construction and Enterprise ..... 170


## TECHNICAL


★ Engineering News at a Glance ..... 89
Hot Pressing 575-Pound Propeller Hubs ..... 90
Metallurgical Aspects of Carbon Steel Spot Welding—Part I ..... 93
Straight-Line Magneto Production ..... 96
Light Metals in Automotive Construction ..... 102
Automatic Mechanical Ladling in Die Casting ..... 108
Vertical Conveying System Saves Floor Space ..... 111
★ Progress in Steelmaking—British Mill Rolls Special Sections ..... 112
★ Letters to the Editors ..... 118
Lock Washer Torsion Test Provides Clear Results ..... 126
Precision Method of Fabricating Makes Gridded Bearings ..... 128
★ New Products and Equipment ..... 131
★ Helpful Literature ..... 143


## MARKETS


★ Market Summary ..... 145
★ Market Prices and Composites ..... 146
Major Nonferrous Metal Prices Hold Steady ..... 152
Lack of Semifinished Steel Slows Wire Mills ..... 160

★ *Index to Advertisers* ..... 176


★—Denotes regular features.

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March 15, 1948

# Untenable Hot Spot

In order to fully understand the recent outburst of criticism against leading steel companies, it is necessary to consider the position of United States Steel Corp. in relation to other steel companies over a period of years.

From its organization in 1901 until 1938 the influence exerted upon the steel industry by U. S. Steel because of its size was largely in the area of prices and markets. During this period this influence was variously regarded as good or bad. At times the corporation was under criticism for its policies; at other times its influence was considered benevolent.

In 1937 when conversations between Myron C. Taylor and John L. Lewis led to recognition of the United Steelworkers-CIO as bargaining agent for employees of the corporation's operating subsidiaries, the potential for U. S. Steel's influence in the steel industry was broadened tremendously. Henceforth, corporation decisions were to affect the industry not only as to prices and markets, but also as to wages and working conditions.

Soon it became apparent that an agreement on wages between U. S. Steel and United Steelworkers-CIO established a "pattern" to which thousands of companies in or tangent to the steel industry were virtually forced to conform. This sharply accentuated growth in the influence of U. S. Steel's decisions was again demonstrated in the captive coal mine settlement of 1947 when U. S. Steel, Consolidated Coal and United Mine Workers made a pact which committed almost every industrial corporation in the country to conditions over which it had practically no control.

It was against this background of the steadily expanding influence of U. S. Steel's decisions that the seemingly trivial boost in semifinished steel prices provoked an unprecedentedly spontaneous and unanimous outcry against Big Steel. Fundamentally it was a protest against too heavily concentrated economic power.

Thus U. S. Steel finds itself unwittingly wielding an influence more powerful and far reaching than was contemplated or is desirable. Its predicament in this respect is shared in varying degree by Bethlehem Steel, Republic Steel, General Motors, Ford Motor, General Electric, Westinghouse and a few others.

For the good of all business, big business now should be looking for ways of democratizing industry so that its top management can get off its present uncomfortable hot spot.

* * *

**SCRAP FROM BIZONIA:** Report of the Department of Commerce Iron & Steel Scrap Mission to Germany indicates that there is a large potential volume of scrap in Germany in excess of local needs but that numerous obstacles must be overcome before it can become available for use in the United States.

According to the mission, the largest reservoir of scrap in the British and American zones is rubble scrap, the potential tonnage of which is estimated at from 3 to 10 million tons. One-third of this scrap is in destroyed residential, commercial and public buildings. It is widely scattered and a considerable amount of concrete, brick and debris must be removed to release a relatively small amount of ferrous material.

The other two-thirds of rubble scrap is in damaged or destroyed railways, bridges and large industrial works. Much of this scrap is readily accessible. In the Krupp works in Essen scrap amounting to from one-half to three-quarters of a million tons is concentrated in an area of four square miles.

With something like six million tons of scrap

(OVER)

physically within reach in Bizonal Germany almost immediately, it would seem that somehow our government could find ways to surmount the difficulties of diverse ownership, currency uncertainties and red tape so as to release this tonnage for shipment at the earliest possible moment.

The report is in. It is advisory. It is being "examined at policy level by respective government departments to determine their final position on the recommendations." It is to be hoped these departments will act promptly and decisively. This scrap is extremely important to the nation's economy. —p. 61

* * *

**COMPETITOR FOR ERP:** The coup in Czechoslovakia, threat to Finland and other Russian activities not only are stimulating stronger congressional support for the Marshall Plan but also are alerting executive departments to renewed attention to problems of national defense.

This tenser and more realistic attitude of Washington is reflected in greater efforts to control the distribution of American exports so as to "help friends and not help enemies," in proposals for increased expenditures for stockpiling of critical materials and in acceleration of plans for industrial mobilization.

These and other outcomes of Russia's present aggressiveness in the "cold" war will have an impact upon industry which sooner or later will be felt in the demand for materials, supplies and equipment. It is likely that national security shortly will be competing with ERP for priority for some already tight products of industry. —p. 63

* * *

**BILLIONS FOR ROADS:** With a total registration of 37 million automobiles in the nation at the present time, it is estimated that motor car travel now is at the rate of 370 billion vehicle miles annually. This is roughly equivalent to a solo trip across the United States from the Atlantic to the Pacific once a year for every man, woman and child in the United States.

The impact of such unprecedented heavy traffic upon the nation's highways is terrific. Experts declare that between now and 1957, 42 per cent of the country's existing high type roads—which in many localities already are woefully inadequate—will wear out. Highway needs in the 48 states and the District of Columbia are estimated at $22 billion.

As a starter toward this tremendous job of road rehabilitation and expansion, Washington is planning an expenditure of $500 million annually in 1949, 1950 and 1951 for the Federal Aid Highway Program. This billion and a half will be the forerunner of untold billions to be spent eventually for roadway materials, equipment, supplies and accessories. Highway construction and maintenance soon will be one of the nation's biggest businesses. —p. 70

* * *

**EXPORTS FROM JAPAN:** Supreme Commander Allied Powers has issued a statement of the estimated production of metalworking products permitted for export from Japan during the first quarter of 1948. The list includes such items as 500 automobiles, 1000 2½-ton trucks, 600 electric sewing machines, 10,000 bicycles and 28,500 electric fans. Locomotives, freight cars, diesel engines, agricultural machinery, mining equipment and many other manufactures "are in limited production or may be produced on special order."

Here is a resurrected source of certain industrial products now urgently needed in many places throughout the world. An obvious question is: To what small extent can Japan's reviving industry help ease the burden of the United States for world recovery? Assistance in 1948 will be welcome. —p. 70

* * *

**CUT PRODUCTION COST:** Canton Drop Forging & Mfg. Co. is producing 575-lb three and four-way aircraft propeller hubs on special 6000 ton hydraulic presses. The presses were installed in the wartime production of aluminum cylinder head forgings. Their adaptation to the production of propeller hubs of SAE 4340 steel has resulted in substantial savings in forging, heat treating and machining time.

Each press has one vertical cylinder and three or four horizontal cylinders. The forging blank is placed in a die. The vertical plunger descends, partially piercing it and holding it in place while the horizontal rams pierce the barrel. The entire operation consumes about 90 seconds. This is another excellent example of production economies that can be effected when one has sufficient volume of work to justify special equipment. —p. 90

E. L. Shaner

EDITOR-IN-CHIEF

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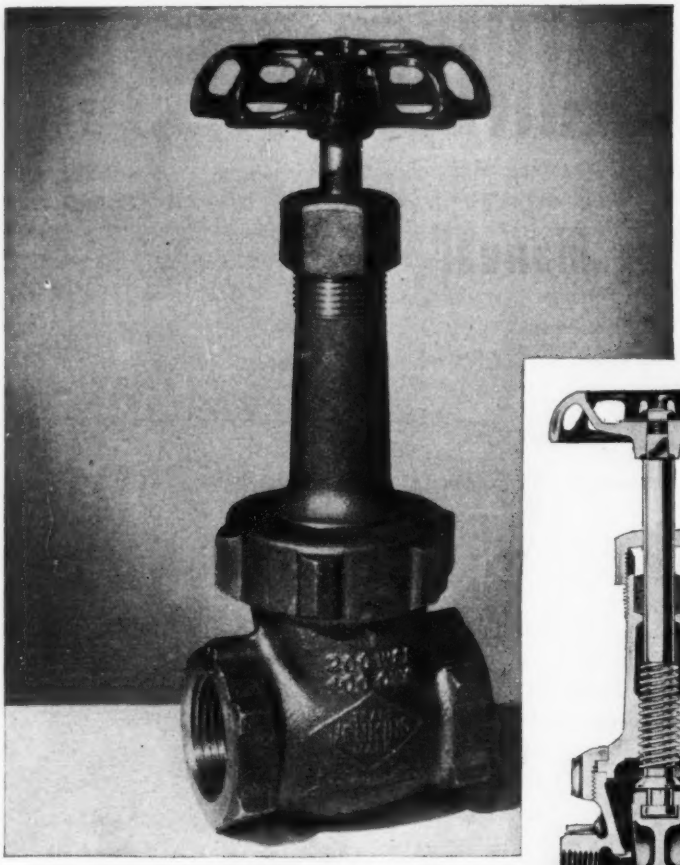

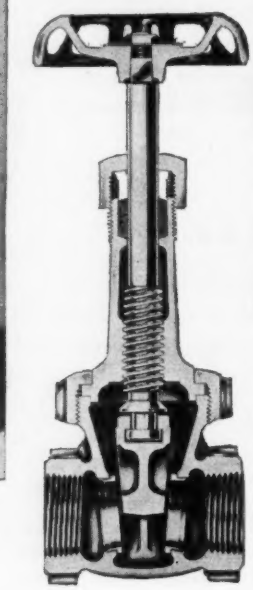

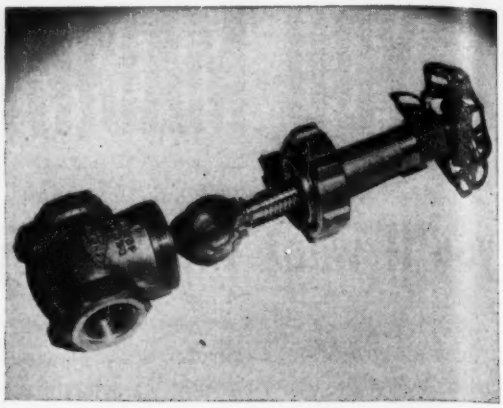

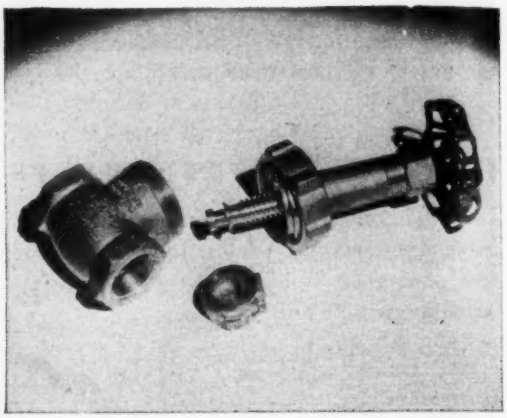

*Above views show how easy it is to replace the bronze wedge. New wedges are inexpensive and readily available. The valves, made by Jenkins Bros., 80 White Street, New York 13, are now carried in stock by all regular suppliers of Jenkins valves.*

*Cut-away view of the new Jenkins Fig. 270-U bronze gate valve. It is the first time the combination of a bronze wedge and Monel seat rings has been available in a small, moderately-priced valve. The seat rings are worked to a hardness of 190 Brinell—about 2½ times as hard as valve bronze.*

# NEW VALVE

## solves old maintenance problem

The wedge of a gate valve is much easier to replace than the seats. When the valve starts to leak, all a workman has to do is shut off the pressure, unscrew the bonnet and replace the wedge.

Unfortunately, the seats usually take more of a beating than the wedge. When the valve is open, the wedge is up out of the stream flow. The seats, on the other hand, are exposed to the erosive and corrosive action of whatever fluid the pipe line is carrying.

This gave designers at Jenkins Bros. an idea. Why not develop a small, moderately-priced gate valve in which the seats could be counted on to outlast the wedge? It sounded easy... just make the seats out of a more durable material than the wedge. If they could find a hard, corrosion-resistant material that was also machinable, they could substitute wrought seat rings for the cast ones found in more costly valves. Monel furnished them with the answer.

The new valve is the Jenkins Fig. 270-U bronze gate valve, available in sizes from ¼ inch to 2 inches. It will handle 200 lbs. of 500°F. steam or 400 lbs. of oil, water or gas.

The wrought Monel seat rings are expanded into the valve body. In tests, the high-quality bronze wedge seated tightly against them through several thousand openings and closures carrying steam at normal working pressures. When it finally wore, it was replaced, and the tight seal was restored. A new wedge for a 1-inch valve costs about $1.00. Thus, at a maximum cost of a few dollars, the service life of the new valve can be indefinitely prolonged—larger Monel-trimmed gate valves have lasted 25 years or more.

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# News Summary

**RAW MATERIALS SCARCE**—Steel consumers hold no monopoly on the shortage of materials. Producers lack (p. 61) adequate quantities of scrap and iron ore. Future coal supply is uncertain, as usual, due to the unpredictability of John L. Lewis' actions. Limestone may become critically short for lack of transportation facilities. At least one Pittsburgh district blast furnace operator will ship ore all-rail from Duluth, paying a heavy freight penalty. Most of these shortages threaten to continue into 1949, if steel demand holds at present levels.

**GERMAN SCRAP**—While a huge surplus of scrap was found in Germany by the special scrap mission representing the steel, scrap and foundries industries, the Germans are reported to be reluctant to collect, process and ship it out of the country (p. 62). They regard the scrap as a national asset. Equipment and machinery for collecting and preparing the scrap is inadequate, while price and currency difficulties raise further obstacles.

**MOBILIZATION PLANS**—Deterioration in international relations is causing increased interest to be focussed on United States plans for mobilization (p. 63). A more tense attitude is noted in Washington, following the Czechoslovakian coup and as the April elections in Italy approach. Actionwise, this attitude is reflected in agitation for increased stockpiling of strategic and critical materials, a much larger aircraft program, acceleration of the national mobilization organization and increased support for the Marshall Plan.

**CANADIAN TRADE**—Canada is sending some of her top-flight industrialists and government officials to the United States to explain why it has been necessary to restrict her imports from this country to conserve her exchange position. Last week, President Douglas B. Greig of Ford of Canada explained the Dominion's position (p. 75) to automotive people in Detroit. The Dominion's problem is one of too many dollars going out and not enough coming in. This has necessitated sharp curbs of imports of automobiles and parts, as well as other materials, and development of home sources of supply.

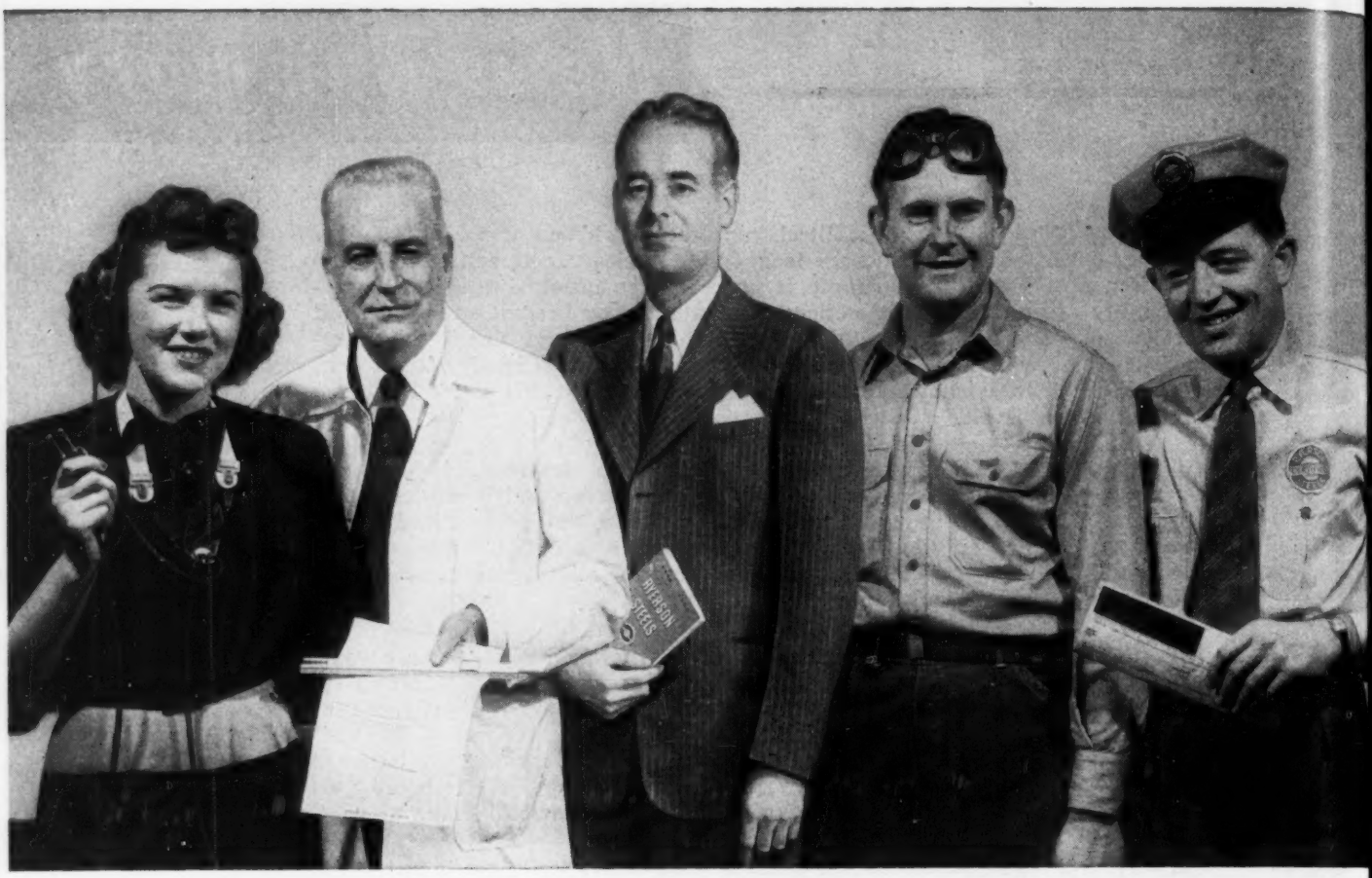
**CONSTRUCTION COSTS**—Soaring construction costs have placed large difficulties in the paths of metalworking companies undertaking large expansion and improvement programs. Allegheny Ludlum Steel Corp., for example, figures a program originally estimated to cost $15 million will actually cost $24 million (p. 78), necessitating large borrowings.

**STEEL PRICES**—Recent furor over the increase in semifinished steel prices has about run its course in the public press, and reports on the action by the various investigating government agencies are not receiving the attention attracted by the original stories. Generally, the probing groups found the increases to be actually small, but dangerous in that they add to inflation psychology.

**SURPLUS TOOLS FOR EUROPE**—Let Europe have our surplus machine tools now. This is the advice (p. 65) of Charles A. Simmons, president of Simmons Machine Tool Corp. and a former War Production Board official.

**SIGNS OF THE TIMES**—Mixing grain alcohol with gasoline to obtain a higher octane fuel is proposed as the automotive industry progresses toward higher compression engines (p. 75). To be economical, a method of making alcohol from waste products must be developed. . . . Goal for German steel production has been raised to 6 million tons annually by Allied Control authorities (p. 72). . . . Congress is being asked to continue (p. 70) federal highway aid in the amount of $500 million annually for the next three years. . . . Steel allocation procedure is being charted (p. 66) by the Office of Industry Co-operation. . . . Portsmouth Steel Corp. will complete installation of its new sheet mill (p. 65) early in April. . . . Earlier forecasts of industrial activity on par with or above the 1947 level are being borne out (p. 80) by current indexes.

*Engineering News, P. 89* *Market Summary, P. 145*

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# RYERSON STEEL

# Raw Materials Supply Plagues Steel Producers

**Ore stocks far below normal and shortage may continue through 1949. One mill will ship all-rail to Pittsburgh district. Steel users co-operating in scrap collections; many drives started. Management watches for possible "holiday" for coal miners**

*Robena mine, operated by the H. C. Frick Coke Co., is approaching production of 20,000 tons of coal daily to help U. S. Steel's Pittsburgh mills set new peacetime production records. Above, the tipple feeds coal into barges for the haul to Clairton coke plant*

STEEL users, long plagued by the scarcity of finished steel products, aren't the only ones in the industry bothered by shortages.

The producers are having their procurement problems too. Among the toughest are raw materials.

There's scrap. Despite prices double the wartime OPA ceiling, the shortage of this material is and has been restricting steel production.

There's coal. Currently, supplies are fair, but steel producers are keeping their fingers crossed lest John L. Lewis take another holiday and close the mines. Steel mill stocks of coal amount to only about a month's operations and any shutdown of the mines would be quickly reflected in steel mill operations, as they have been in previous stoppages.

There's iron ore. Stocks at furnaces and lower lake docks are dangerously low, and by the opening of the 1948 shipping season will be the smallest in several decades. At least one Pittsburgh blast furnace operator will ship ore all-rail from the head of the lakes. Several others are considering all-rail shipments, but hope to avoid such expensive measures. Swaps between ore users to obtain needed grades will be fairly common.

There's limestone. Here the difficulty lies in the shortage of transportation. Bulk carriers probably will not be available to ship all the stone needed during the coming season.

**Ore Stocks Dwindle**—Blast furnace operators are watching ice conditions on the Great Lakes with more than usual interest this spring. Stocks of iron ore at furnaces and lower lake docks are estimated at 19 million tons as of Mar. 15. Consumption during the remainder of March and in April should be between 10 and 11 million tons, reducing May 1 stocks to less than 9 million tons plus whatever is shipped in April.

Lowest previous carryover on May 1 was in 1937, when 14.6 million tons were on hand at docks and furnaces.

So low are stocks that several blast furnace operators have given consideration to shipping some ore from the upper lakes all-rail before the lake shipping season opens, an unprecedented action. In fact, Pittsburgh Steel Co. has obtained an all-rail freight rate of $5.10 from Duluth to Monessen and will ship a minimum of 50,000 tons of ore to the blast furnace it recently purchased from the government and which it expects to blow in about Apr. 15. Other operators are hopeful that it will not be necessary to ship all-rail, and that their ore supplies can be eked out by swaps and transfers. Pittsburgh Steel will be paying a freight premium of $1.31 a ton on its all-rail shipments, the water-rail rate being $3.79, against the all-rail rate of $5.10.

**Looking to 1949**—Not only will the blast furnace operators be hard pressed for ore just prior to the opening of the 1948 lake shipping season, but they are confronted by the longer-range problem of building up stocks to carry them through the 1948-49 winter. Consumption of ore currently is running about 7 million tons a month. Several new blast furnaces either recently have been added or soon will be added to the group dependent on Lake Superior ore and may raise monthly consumption by 200,000 tons or more. Barring interruptions to production and assuming continued high demand, this indicates consumption may reach 86 million tons or more annually. With scant stocks to start with, this means a near-record tonnage must be moved down the lakes during the coming season to carry through next winter.

Top season for ore shipments was in 1942 when the industry went all out to build up an adequate inventory for war purposes. About 92 million tons were shipped down the lakes, with the total movement, including all-rail shipments, amounting to 93.5 million tons. Fleet capacity has not changed substantially since then.

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806,145 tons shipped all-rail to consuming plants and 77,878,998 tons shipped to upper lake ports for movement by water (for details see Page 162).

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starter it will have a number of breakdowns to cover key metalworking industries; those breakdowns already on the blueprint include the automobile, communications manufacturing, shipbuilding and aviation industries, and there will be others later.

**Planning Staff**—Under the procedure laid down by Mr. Hill, the board will have only a planning staff. It will not duplicate the work of the various government departments and agencies that already are set up with working staffs. Rather, the board will call on these governmental units for information and services, and will concern itself with overall planning. For example, the board will make use of the facilities of Commerce, Treasury, Interior, Labor, Navy, Army, Air Force, and such agencies as the Federal Reserve Board, RFC, Social Security Board, Council of Economic Advisers, etc.

The board also will work with committees and other representatives of the industries to be included in mobilization plans. To this end it is scrutinizing the industry advisory committees with which the various branches of the government now are in contact, and will work out a chart showing the lines of contact either as they now stand or as they should be revamped to serve the purposes of the board. Of course, as Mr. Hill has previously announced, the contacts with the various industries will be organized and maintained with the assistance of the Munitions Board.

Mr. McLaughlin, who now may be in line actually to direct mobilization of the metalworking industries in event of war, left the post of chief of the Economics & Resources Division of the Bureau of Reclamation to take on his new responsibility. Born in Prague, Okla., July 4, 1904, he was graduated from Colorado College, Columbia, Harvard and a German university. For 10 years he was industrial economist at the Bureau of Business Research, University of Pittsburgh. Since 1940 he has been with the government, first as chief of the Industrial Section, National Resources Planning Board, then as economic consultant with the War Production Board. For a time after the war, before going with Reclamation, he was chief economist of the War Assets Administration's Plant Disposal Division.

**Organization Chart**—First organization chart of the National Security Resources Board, setting up twenty-four divisions, was made public last week by Arthur M. Hill, chairman of the board. Organized Nov. 13, 1947, the board was created under

GLENN E. McLAUGHLIN
*Appointed director, Production Facilities Division, National Security Resources Board*

the National Security Act of 1947 and has the responsibility under law to "advise the President concerning the co-ordination of military, industrial and civilian mobilization."

The board's chart lists four administrative and co-ordinating staff divisions: Program Division, Office of the Secretary, Office of the General Counsel, and Information Division.

**Broken Into Groups** — There are twenty Mobilization Planning Staff Divisions, broken down into four groups as follows:

1. Divisions dealing with industrial resources: Power and Utilities Division; Transportation Division; Communications Division; Production Facilities Division.

2. Divisions dealing with material resources: Petroleum Division; Iron and Steel Division; Fuels Division; Chemicals, Rubber and Plastics Division; Nonferrous Metals Division; Nonmetallic Minerals Division; Timber and Forest Products Division; Textiles, Fibers and Leather Division; Agricultural Products Division.

3. Divisions dealing with human resources: Manpower Division; Medical Division; War Information and Censorship Division; Community Facilities and Activities Division.

4. Divisions dealing with organization and management: Economic Stabilization Division; Foreign Economics Division; Organization and Procedures Division.

# Labor Supply Is Increasing On West Coast

HERE and there along the West Coast signs of increasing unemployment are appearing.

A number of factories and commercial establishments have begun laying off workers, while others have reduced hiring rates. Many companies also have tightened requirements with the aim of increasing their number of skilled workers.

Although these occurrences in the western labor situation thus far are too spotty and disconnected to establish an overall trend, there is evidence that a pattern of reduced labor demand may be approaching for the West Coast's economy.

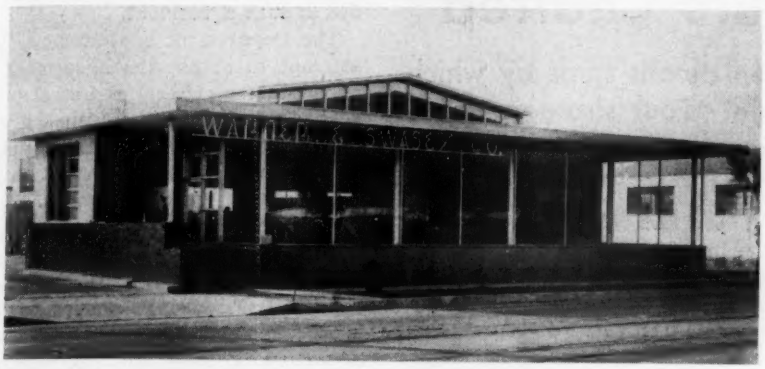
**Labor Supply Gaining** — For example, governmental labor placement agencies say California's labor supply, which is still being increased by an influx of workers from other areas, is beginning to forge ahead of industrial growth.

At the same time, high living costs are putting a blanket of consumer resistance over production of some types of goods with the resultant effect of reducing factory operations and thus labor demand. This trend is being hastened by narrowing of the gap between supply and demand of many products. In fact, there is ample evidence that some industries now are producing more than the market will take.

**Drought Is Factor** — Another factor which may seriously affect California's employment in coming months is the serious drought affecting that state. The shortage of power resulting from the drought is a major factor curtailing industrial and agricultural operations. This, in turn, eventually will also affect purchasing power of a large part of the population.

Many metal-using industries on the West Coast are effecting labor reductions for one reason or another. Some companies are affected by continued shortages of steel and other metals. Others, however, are being hit by reduced demand for their production.

A prime example is the aircraft industry which still is trimming employment. Many aircraft partsmakers, too, are feeling the pinch and are retrenching. Small job machine shops which depend for their livelihood on subcontracts from larger concerns have been hard hit.



WESTERN SHOWROOM: Warner & Swasey Co., Cleveland, will open its new Los Angeles showroom, warehouse and western sales headquarters at 3340 Leonis Boulevard in Vernon during the week of Mar. 22. L. R. Hawkins, district manager in California, will be in charge of the new headquarters, pictured above

# Urges Europe Get Surplus Tools

LET ERP HAVE our surplus machine tools—now! is the plea of Charles A. Simmons, president, Simmons Machine Tool Corp., Albany, N. Y., and former chief of the Used Tools Division, War Production Board.

Returning to this country after a tour of western Europe and Austria, Mr. Simmons advises that the 200,000 or more machine tools held by War Assets Administration or frozen by other branches of the government, if allocated to the European Recovery Program "without delay," could save "in the vicinity of $2 billion."

Without machine tools European countries "cannot hope to rebuild their economy . . . If this equipment is not supplied promptly, ERP will have to be carried on indefinitely," he asserts.

**Stockpiling Less Essential**—Pointing out that "any experienced machine tool man will disagree" with government officials who believe that tools earmarked for future use can be processed to last indefinitely, Mr. Simmons says "freezing of the greater portion of this machinery by the Joint Army-Navy Machine Tool Committee and other agencies for future needs has little merit. Why not put them to use now to strengthen our defense?"

Although WAA's sales to foreign buyers in the past "were far from impressive," he contends, the reason for lack of foreign interest lay in the red tape connected with purchasing and the condition of tools upon arrival.

The argument that the countries need new machines rather than surpluses, in his opinion, is faulty. Second-hand tools were the means of getting war production started in 1940 and aided considerably when American industry went back to its regular lines after the war. "If our leading industries can produce with second-hand machinery, so can Europe's," he says.

**Inventorying and Servicing Vital**—To dispose of this surplus and charge it against the machine tool requirements of ERP-participating nations, a complete inventory of available tools should be taken, with this to be done "by machinery men who know what they're compiling," he recommends. Then, he suggests, the original manufacturer or reputable machine tool rebuilder should service each tool to make certain it is complete and in good operating condition before forwarding it to a shipping point, with costs of these operations determined as a percentage of the original or present-day cost of the machine and charged against funds allocated for tools under ERP.

**Sees Tools Ending Up as Scrap**—Sharply critical of WAA's machine tool sales currently being conducted at Bronx and Buffalo, N. Y., and Linden, N. J., warehouses, Mr. Simmons predicts "the greater part of this machinery, which consists of late-model standard machine tools, all usuable in Europe, will be scrapped.

## Rise Noted in Detroit Plants' Tooling Activity

Tooling programs for new Chrysler models are moving along at accelerated pace, although production can hardly be expected before December. Reports are heard that new Buick models may hit assembly lines as early as September, featuring the new body type now being used by Cadillac and the largest Olds model.

Kaiser-Frazer will revise its press room layout next month and will install ten Clearing and Bliss presses.

## Portsmouth's New Sheet Mill Nearing Completion

Portsmouth Steel Corp., Portsmouth, O., will complete installation of its new sheet mill the early part of next month, according to Harold J. Ruttenberg, vice president. The mill comprises two 3-high mills and three 2-high mills and will roll sheets down to 22 gage.

One 3-high mill was placed in operation about a month ago and two 2-high mills went in last week. The second 3-high and the third 2-high mills now are being installed.

## Fontana Steel Plant Expansion Authorized

A $3 million expansion of the Fontana, Calif., steel plant of the Kaiser Co. Inc. last week was authorized by the Reconstruction Finance Corp. which holds a mortgage on the wartime built plant.

One new open-hearth furnace with soaking pit and other facilities are included. Installation of still another open-hearth furnace is under consideration.

The new Fontana facilities are expected to be in production in six or eight months and to add 100,000 tons annually to ingot production capacity of the plant which now has six open hearths with annual capacity of 780,000 tons of steel ingots.

## Court Finds Pricing by Cross-Licensing Illegal

Holding that it is unlawful to use patent cross-licensing to fix prices, the Supreme Court last week upheld the government in an antitrust suit against Line Material Co., Milwaukee, and Southern States Equipment Corp., Birmingham.

The government had appealed a lower court decision throwing out the suit and had asked the Supreme Court to over-rule the so-called General Electric decision which allowed a holder of a patent to fix the price at which an item manufactured under license could be sold.

# Allocation Procedure Charted

## Office of Industry Co-operation details steps by which steel allotments are determined. Four strategic shortage areas so far designated to participate

PROCEDURE to be followed in determining allocations of steel under the voluntary agreements authorized by Public Law 395 was announced last week by the Office of Industry Co-operation.

Steel supplies are to be made available on an allocations basis only to users in a limited number of critical shortage areas. The voluntary agreements program is intended to operate with minimum disruption to normal production and distribution in "providing for priority, allocation and inventory control of scarce commodities which basically affect the cost of living or industrial production."

**Four Areas Designated**—The four strategic areas designated thus far for consideration under the program are: (1) Domestic freight car production and repair of railway rolling stock; (2) petroleum, gas and oil equipment; (3) urgently needed agricultural equipment; and, (4) certain housing materials.

Procedure for steel allocations under the voluntary agreements program follows:

The secretary of commerce, with the advice of the Advisory Committee of a steel consuming industry, will submit to the Steel Advisory Committee such program as he believes should receive consideration for the purposes of a voluntary agreement, together with supporting data which shall include:

1. The number of manufacturers represented,
2. The specific products covered,
3. The steel required, by product, by tons, and by end-use,
4. A comparison of the proposed program with the production program, by product, of the steel consuming industry, for the years 1936-1939, inclusive, and the current production program,
5. The reasons why an increase, if any, above present commitments by the steel industry is essential to the carrying out of the proposed program, and
6. Evidence that the proposed program meets the declaration of purposes expressed in section 1 of Public Law No. 395.

**Program Subject to Review**—If it is recommended by the Steel Advisory Committee that the steel producing industry participate in the proposed program, the secretary will forward it to the director of the Iron & Steel Division of OIC for review with the Steel Products Advisory Committee (composed of representatives of the steel producing industry) as to the available supplies of the various items of steel products needed under the program.

Subject to the conclusions reached upon such review, the program will be submitted to the task force (to be composed of representatives of the steel producing industry appointed by the secretary of commerce). It shall be the function of the task force to submit recommendations to the secretary as to equitable allocation of tonnage, by products, among steel producers.

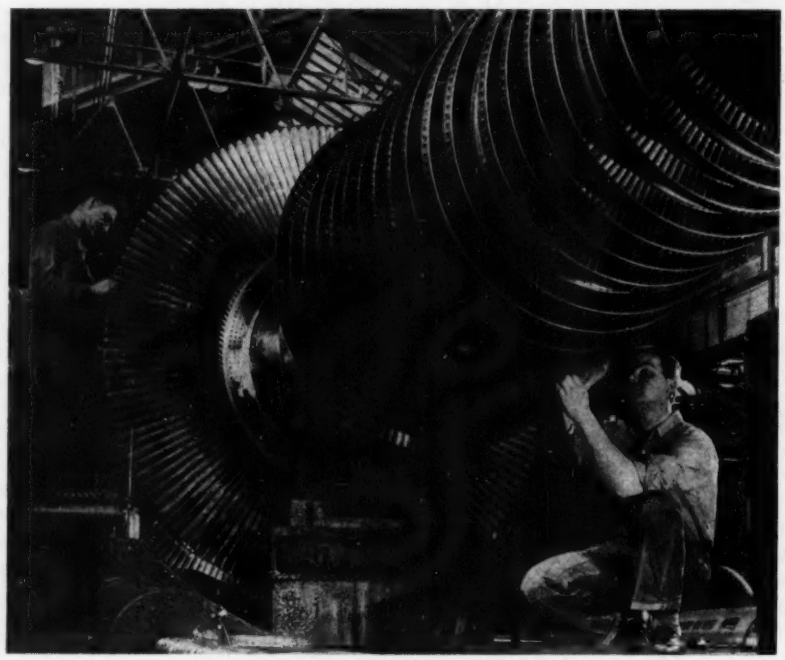
Any such voluntary agreement shall include provision to the effect that steel consuming interests to which steel is made available under the agreement shall undertake that such steel shall not be used by them for any purpose other than that specified in such agreement.

The Department of Commerce will attempt to obtain the agreement of all producers of steel and steel products to participate in any such agreement in their proportionate shares as determined in accordance with the provisions of such agreement.

**Hold Public Hearing**—The first public hearing under the voluntary allocation agreements program was held last Friday. It concerned the proposed voluntary agreement for allocation of steel and pig iron for the freight car building and repair program, and was held in the auditorium of the Department of Commerce. Interested parties were given the chance to present their views.

The agreement follows the general pattern of the program already in effect under supervision of the Office of Defense Transportation. The objective of the plan is to provide sufficient steel and pig iron for the building of 10,000 new domestic freight cars monthly and for normal repair of domestic freight cars, passenger cars and locomotives.

Under the proposed plan the steel companies agreeing to it will make available on an average monthly basis sufficient steel of the various types necessary to construct 10,000 cars



POWER FOR TWO MILLION LAMPS: Steam turbine rotor, shown here suspended on a huge lathe at the Schenectady works of General Electric Co., is receiving final inspection prior to assembly for test run. Weighing 60,000 pounds, the rotor is 29 feet long. In operation, steam will drive the many fin-like buckets to turn the rotor. The generator will develop 100,000 kilowatts of electricity, enough to light 2,000,000 household lamps

monthly and permit normal repair. Pig iron producers, likewise, will make available such quantities of iron as may be required. Overall quantities of steel and pig iron to be furnished will be determined quarterly by the Secretary of Commerce after consulting with the director of the Office of Defense Transportation. Within such overall quantities the amounts of the various types of steel to be made available under the program by the individual steel companies will be determined by the ODT on such basis as it deems fair and equitable after consulting with the industry advisory committees on distribution.

**Will Submit Schedules**—Carbuilders will submit to the ODT schedules showing by plants the number and types of domestic freight cars scheduled for production monthly. Individual carbuilders, component parts manufacturers, railroads and private car lines will submit to ODT quarterly estimates of their steel and pig iron needs.

After receiving the quarterly estimates of needs, ODT with the assistance of three industry advisory committees will relate estimated requirements to the overall program. Quantities and types of steel and pig iron to be made available quarterly to each individual steel consumer will be determined by the ODT. In determining such quotas, consideration will be given past production records of each car builder, plant capacity, and orders for new cars each builder has on hand. A company not now engaged in constructing freight cars under the program but which is in a position to engage in such activity may become a participant in the program.

Each individual consumer will make its own arrangements for securing the steel and pig iron assigned to it. However, ODT with the aid of the industry advisory committees will furnish assistance to individual consumers in securing the quantities of steel and pig iron assigned to them. No request or authorization will be made relating to allocation of orders, customers, delivery of cars or business among members of the car building industry, nor will any request or authorization be made to the steel industry or pig iron producers for any limitation or restriction on production or marketing of steel and pig iron.

**Use Restricted**—Participating consumers agree to show on their purchase orders for steel and pig iron that the steel or pig iron is to be used for new domestic freight cars or to be used for repair of domestic

(*Please turn to Page* 167)

# FTC Secures Steel Price Data

## Steel producers furnish information covering period Oct. 1, 1935, through Nov. 13, 1947, at hearing. Base price announcements and extra cards included

*WASHINGTON*

RESPONDENTS in the Federal Trade Commission's steel case last week supplied their price literature covering the period Oct. 1, 1935-Nov. 13, 1947, inclusive. This included copies of base price announcements and lists of extras issued by the companies during that period. By the end of this week practically all respondents will have complied with the request for these data.

The hearing was highlighted by arguments involving some various legal points. Steel company attorneys quoted court decisions and rules of evidence in a vain effort to prevent dismissal of the witnesses who identified the price literature. The attorneys wanted to have these witnesses—all high officials of the steel companies—declared subject to recall for cross examination.

They pointed out that Trial Attorney Lynn C. Paulson did not enter the price documents into the record but merely had them marked for purposes of identification. They wanted the right to recall witnesses in order to question any use of this material which Mr. Paulson may choose to make at a later date.

**Jockey for Position**—Trial Examiner Frank Hier ruled that in view of Mr. Paulson's tactics in using the witnesses merely to establish the identity and authenticity of the price and extra documents, he had no recourse except to rule against the steel attorneys. Later on, he conceded the steel company attorneys may desire to attack such conclusions as may be drawn from a study of the price literature.

The first witness, J. Douglas Darby, general manager of sales, Carnegie-Illinois Steel Corp., was asked numerous questions by Judge Elder W. Marshall, United States Steel Corp. attorney, as to what the price documents showed, whether his company considered the price announcements to be "announcements," what dates the announcements were issued and on what dates the announced prices were to become effective. To whom —if anybody—were the announcements sent, were any prices announced over the telephone whether included in the printed announcements or not, when prices were announced to the sales offices, when they were publicly announced, etc.

**Objects to Questions**—To all these questions Mr. Paulson objected on the ground that he had used Mr. Darby merely to identify the documents and declared them to be authentic—and the trial examiner sustained him.

Under Mr. Hier's ruling, the price records will remain in his custody, to be consulted as desired by attorneys on both sides.

"Some of these price documents are in the form of bound volumes 9 inches thick and altogether there are thousands of pages. Mr. Paulson may not want to use all this material and, to simplify the procedure, he should have a chance to go over it and separate the wheat from the chaff," declared Examiner Hier.

Despite objections, steel attorneys were able to get in some responses in cross examination. Mr. Darby and Carl I. Collins, president, Superior Steel Corp., testified that in deciding prices on their products they never consulted with competitors. Mr. Darby explained Carnegie-Illinois' price announcements were never regarded as containing the prices of other producers excepting for the period of OPA control—April 16, 1941, through June 30, 1947.

**Price Policy**—Halted by sustained objections, John C. Bane Jr., attorney for a number of steel companies, dictated into the record an "offer" to prove that prices received by his clients were lower than the prices they had announced. Mr. Bane told reporters during a recess that one of the things he had intended to bring out in questioning (that was while Mr. Collins was on the stand) was that his clients, including Superior, usually followed the price leadership of United States Steel subsidiaries. After the U. S. Steel subsidiaries had acted, he said, his clients would compile their price announcements and date them back to the day on which the new prices of the Steel Corporation became effective. By last week's rulings of the trial examiner, all such defense arguments must be reserved until a later date. It is expected the present phase of the hearing will be conducted this week.

The majority of the steel companies filed their price data without the use of witnesses. This was done through agreements between opposing counsel.

# Windows of Washington

By E. C. KREUTZBERG — *Washington Editor, STEEL*

## St. Lawrence Seaway, perennial project, scuttled by Senate for another year. High costs, opposition of steel industry, international situation cited by opponents

PREVAILING arguments against the St. Lawrence Seaway project were summed up by Sen. John W. Bricker (Rep., O.) as the Senate scuttled the project for this year by a vote of 57 to 30 on Feb. 27.

"This is not a good time to enter into the agreement. Costs are high. The international situation is uncertain. Trade relations are unstable. No one today is able to look to the future and ascertain whether or not the project would be valuable, whether or not it might serve the national defense, or whether it might possibly be a national peril.

"Then, the work would be performed largely in a foreign country, subject largely to co-operative control, the details of which have not yet been presented to this body . . . . As to cost, instead of the hundreds of millions that have been mentioned, I am confident that, using costly, scarce materials as we would be required to do, the cost of the project would run into several billions . . . . With the advent of the atomic bomb, the canal, if we became nationally dependent on it as a matter of defense and commerce, might well become a national peril. Its facilities might easily be blown up, transportation halted, and our country's interests imperiled."

Senator Bricker summed up as follows the argument against the claim that the St. Lawrence Seaway is essential as a means of entrance for foreign iron ore:

**Ore Supplies Adequate**—"I have listened to the argument that the American steel industry must have a foreign source of iron ore. I am convinced — in fact, I know — that there is available in our country an adequate supply of reserve ores to take care of the needs of the nation for the foreseeable future and, in fact, for an almost unlimited time. I grant that the high-grade iron ores of the Mesabi Range will become exhausted, at the present rate of consumption, within the next few years, but there are ores of lesser iron content which can be utilized in the industry, and there are adequate reserves to supplant them as the remaining deposits in the Mesabi Range run out.

"The steel companies at the present time are making thorough and adequate preparations for the utilization of the lower-grade ores. If this nation should become dependent upon a foreign source of supply from Labrador or from South America, through the St. Lawrence Seaway, for plants which are already established, I believe that progress in the utilization of the ores of our country would be seriously damaged. We might become dependent upon a foreign source of supply without an adequate preparation to use our own supply, which likewise might be a national peril in time of crisis."

### THROW 'EM AWAY

**Except for three categories, business men no longer need keep their records of goods and of services which were decontrolled by the Office of Price Administration. Easing of the rule requiring OPA record retention for three years from the date of decontrol now limits record keeping to the following three groups:**

**1. Parties to pending actions.**

**2. Recipients or claimants of subsidy, premium or other payments from the government, including producers of copper, lead and zinc ores.**

**3. Sellers of commodities or services to the government under adjustable price schedules.**

**Relaxation of the record keeping rule was concurred in by the Department of Commerce, Department of Agriculture, Reconstruction Finance Corp. and approved by the Department of Justice.**

**Steel Companies Opposed**—"In the light of the testimony and in the light of the position of the steel companies of this country, which are almost unanimously opposed to the St. Lawrence development at the present time, the argument that we need foreign ores for our own development completely fails. I do not know where we can obtain better authority than from the established steel industry of our own country upon which to predicate a judgment as to the availability of local supply, the possibility of its utilization, and the danger of becoming dependent upon a foreign source of iron ore.

"Within the past year there has been expended approximately $1.5 million in testing ores in Labrador. At the present time approximately only 150 million tons of iron ore have been proved in all the great expanse of territory. There was utilized last year, largely through shipments on the Great Lakes, 80 million tons of iron ore. One hundred and fifty million tons, the total amount that has been proved in Labrador to date, amounts to less than a 2-year supply. As a standby it might be useful, but certainly not commensurate with the great reserves in our own country.

"This year there will be expended by the Labrador interests $1.5 million in further explorations. Those interests heretofore have been opposed to the St. Lawrence waterway. At the present time they take the position that 'Now is not the time to proceed with this development. We ought to ascertain further the extent of the deposits in Labrador which would be available for our use before we curb development of our domestic resources in the iron ore field.' "

**Wait and See**—"So I am impressed by the position of the industry, so far as steel and iron-ore development is concerned, that even if the St. Lawrence waterway ought ultimately to be developed we should take another look at it to see whether or not it will be helpful or will be a hindrance to the development of the steel industry upon which our country and the world today are possibly more dependent than ever before in history."

Senator Bricker also summed up opposition fears that dumping of cheap manufactured and farm products, produced by cheap foreign labor, might be encouraged by the all-water transportation which the seaway would make possible, and recommended postponement of further consideration until such time as the world trade situation has become more stabilized.

### Big Business Loses Prestige

Time was when important leaders of industry enjoyed vast prestige with members of Congress, but not

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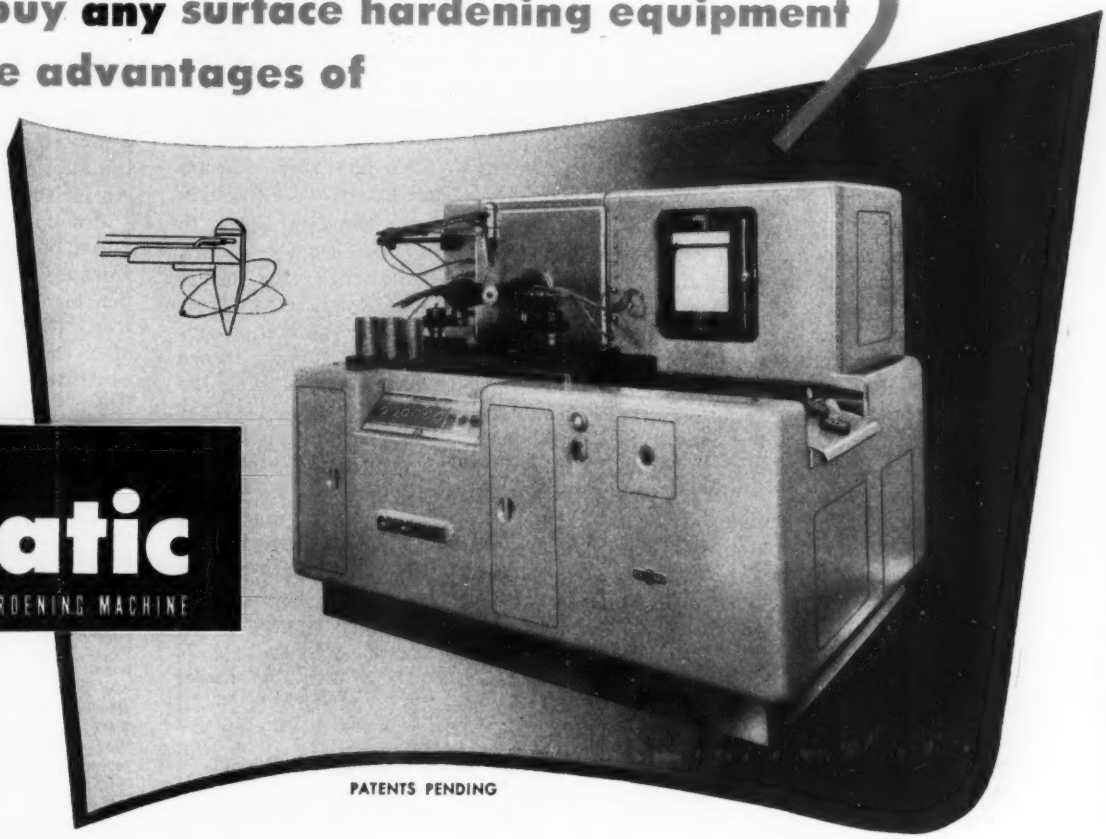

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Automatic except loading. Place work on arbor, then touch button.

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today—at least not in any striking measure. Today "small business" is popular. But for every legislator who is disposed to do favors for big business, there are nine who would rather pursue a line of finding fault with it.

The situation was illustrated during the recent examination of Benjamin F. Fairless and A. B. Homer by the Joint Congressional Committee on the Economic Report. The committee sought to ascertain the reason for the recent advances in steel prices. Four legislators, senators all, figured chiefly in the questioning—and they were extremely critical of the price action of the steel men. It was noteworthy that two caustic critics, Senators Myers and O'Mahoney, are Democrats, and two others, Taft and Flanders, are Republicans—and Senator Flanders is an ex-businessman and banker who is supposed to understand business.

One of the reasons why congressmen in general are rather indifferent to large corporations was revealed by a recent remark on the House floor by Rep. Harold Knutson (Rep., Minn.), chairman of the Ways and Means Committee. That was at the time President Truman had urged a $40 tax cut for individuals as a "cost-of-living bonus," and a compensating increase in taxes on corporations. "The President," said Mr. Knutson, "apparently knows that corporations do not vote."

While Mr. Knutson did not say so, this fact—that corporations do not vote—is generally understood also on Capitol Hill. Most observers are agreed that unless, and until, industrial leaders find some way of making themselves effective in the political arena, their influence in the shaping of national policies will continue at a relatively low level.

## Road Building Big Business

To keep abreast of requirements, road building should be among the country's largest single businesses. That is the situation back of the demands upon Congress to authorize continuance of the federal-aid highway program in the amount of $500 million for each of the fiscal years 1949, 1950 and 1951, according to Don Kennedy, vice president, Automotive Safety Foundation, in a talk before the National Conference of Business Paper Editors in Washington.

Vehicle registration in the U. S., he said, has reached the all-time high of 37 million, and travel now is at the staggering figure of 370 billion vehicle-miles yearly. Between now and 1957, 42 per cent of the country's existing high-type roads are expected to wear out. Moreover, a recent survey of the American Association of State Highway Officials reveals that construction needs of the 48 states and the District of Columbia stand at $22 billion. If this work were carried out at $1.9 billion annually, 15 years would be required to carry it through.

What does roadbuilding mean to manufacturers of capital goods? Mr. Kennedy told the editors the results of a recent Public Roads Administration survey. When $20 million of contracts were analyzed it was shown that the contracting firms doing the work had a total investment of $18 million in equipment, or an investment of 90 per cent of the total value of the contracts on which they were engaged at the time. The machinery they were using included 850 trucks, 300 tractor-scraper, earth-moving units, 116 shovels or draglines, 70 tractor-wagons, 25 crushing plants, 40 pavers, 120 motor graders and 73 rollers—in all, 1650 pieces of major equipment.

## Unions May Merge

Labor observers in Washington think there is good reason to expect laying of a firm groundwork within the next few months for a merger of the American Federation of Labor and the Congress of Industrial Organizations. The two chief obstacles to merger efforts in the past have been or are in process of being removed. One of the stumbling blocks was John L. Lewis who is now again out of the AFL. The other stumbling block is fading out of the picture in view of the firm anti-Communist policy that has been adopted by the CIO and put into practice in major member unions.

## RFC Names Considine

James W. Considine has been appointed as assistant to the board of directors of the Reconstruction Finance Corp. Mr. Considine is also being designated controller of the corporation, reporting directly to the board. Since last August he has served as controller for a large industrial concern.

## May Repeal Export Price Control

Repeal of the government's authority to use "price criteria" in licensing exports would be repealed in legislation which has been approved by the House Banking Committee. Chairman Wolcott (Rep., Mich.) said the vote in favor of repeal was heavy and that he will seek a rule bringing the bill to the House floor in the near future.

## Japan Allowed Limited Exports

Japanese production for export on a limited scale is being permitted by the Supreme Commander Allied Powers for the first quarter of 1948.

Principal imported materials required to support Japanese metalworking exports include bauxite, carbon black, coking coal, iron ore, pig iron, lead, manganese ore, silicon steel sheets, tin plate, tungsten concentrate and tungsten dumet wire.

The estimated production during the first quarter of metalworking products permitted for exports is as follows:

Enamelware plates, basins, trays, bowls, bottles, etc., 150,600 doz.; enamelware rice spoons, 18,250 gross; hand type cultivators, 6000 pc.; hand type hoes, 6000 pc.; hand type plows, 6000 pc.; rice threshing machines, 3000 pc.; automobiles (Austin type), 500 pc.; trucks (2½ ton), 1000 pc.; amplifier systems, 90 pc.; lead covered cable, 3 million meters; power cable, 9000 meters; radio receivers, 15,000 pc.; radio transmitters, 150 pc.; radio weather equipment, 300 pc.; switchboards, 1800 pc.; telephone sets, 6000 pc.; vacuum tubes, receiving, 30,000 pc.; vacuum tubes, repeater, 600 pc.; vacuum tubes, transmitting, 3000 pc.; varnished insulated wire, 300,000 meters.

Rubber insulated wire, 300,000 meters; weather proofed wire, 6000 meters; portable electric sewing machines, 600 pc.; portable hand operated sewing machines, 3000 pc.; treadle type sewing machines, 3000 pc.; aluminumware, 150,000 pc.; automotive batteries, 3000 pc.; storage batteries (other), 1150 pc.; bicycles, 10,000 pc.; bicycle parts, 33,000 sets; binoculars, 9000 pc.; filing cabinets (aluminum), 500 pc.; stationery cabinets (aluminum), 250 pc.; cameras, 7100 pc.; executive desks (aluminum), 125 pc.; electric fans, 28,500 pc.; electric fittings, 500,000 pc.; electric irons, 45,000 pc.; electric light bulbs, 1,500,000 pc.; electric ovens and toasters, 26,000 pc.; footlockers (aluminum), 15,000 pc.

Building hardware, 3000 doz.; miscellaneous hardware, 19,400 doz.; harmonicas, 34,400 doz.; charcoal irons, 3300 doz.; door locks, 3000 doz.; luggage (aluminum), 1500 doz.; metal leaf, 9 million sheets; brass sheets, 300 metric tons; copper sheeting, 600 metric tons; iron sheets (galvanized), 600 metric tons; nichrome wire, 3 metric tons; concrete reinforcing bars, 1500 metric tons.

Brass shoe nails, 150 cwt; iron wire nails, 90 metric tons; padlocks, 4500 doz.; phonographs, 7500 pc.; cast iron rice bowls, 33,400 sets; miscellaneous stainless steelware, 15,000 doz.; steamer trunks (aluminum) 300 pc.; watches and clocks, 100,000 pc.; wire cloth for paper mills, 90 pc.; brass wire netting, 900 rolls; copper wire netting, 900 rolls; galvanized iron wire netting, 7500 rolls; green enamelled iron wire netting, 7500 rolls; brass wood screws, 50,000 gross; iron wood screws, 75,000 gross.

The following Japanese metalworking products are also offered for export. They are in limited production or may be produced on special order:

Public address systems, telegraphic equipment, telephone equipment, electric motors, generators, mercury arc rectifiers, gasoline engines, diesel engines, kerosene engines, industrial leather items, agricultural machinery, sawmill machinery, surfacing and veneer machinery, textile machinery, pumps and riveting hammers, mining equipment, dredgers, steam, electric and diesel locomotives, power plant equipment, printing presses, freight cars, mine cars, trolleys.

# Westinghouse Machine Tool Forum Planned

WESTINGHOUSE Machine Tool Electrification Forum for 1948 will be held in Buffalo, Apr. 22 and 23. The first day's session will convene at the Hotel Statler; the second day's in the auditorium of the Westinghouse Buffalo plant.

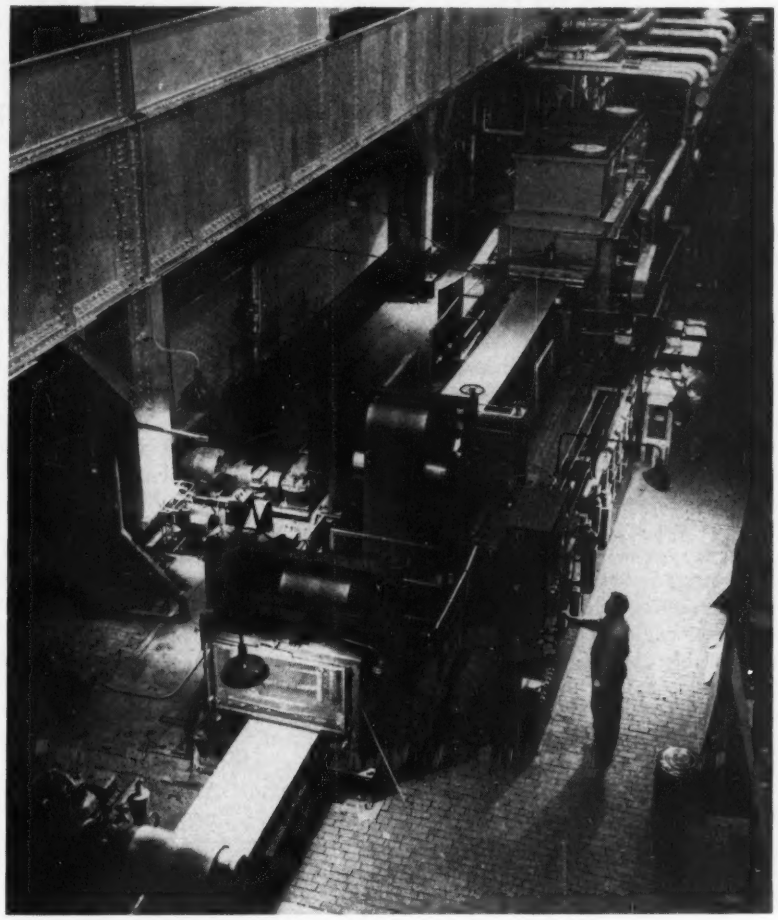
With "control" as this year's keynote, Kermit Kuch, Monarch Machine Tool Co., Sidney, O., will open the discussion on this subject with a paper on "Electronic Lathe Controls." R. J. Teetsell, Westinghouse Electric Corp., Pittsburgh, will discuss "Application of Instruments of Machine Tools." E. P. Bullard III, Bullard Co., Bridgeport, Conn., reveals "A Recent Development in Automatic Lathe Control."

**Speakers Varied** — J. J. Jaeger, Pratt & Whitney Division, Hartford, Conn., discusses problems in Keller-controlled machines. Other papers include "Oscillographic Performance Analysis of Automatic Tool Sharpener" by Royce Johnson, Barber Coleman Co., Rockford, Ill.; and "Turning Points in the Metalworking Industry" by Myron S. Curtis, Warner & Swasey Co., Cleveland. The final paper of the first day's session will be a "Report of the National Machine Tool Builders' Association Electrical Committee."

G. H. Welsh, manager of the Westinghouse Control Division, will open the discussion on the second day with a "Resume of Control Production Facilities and Plans for the Future." G. A. Caldwell, of the same Westinghouse division, will discuss "Electronic Motor Control." L. W. Herchenroeder, Westinghouse Industry Engineering Department, will talk on "Selecting D-C Power Sources for Machine Tools."

**Plant Tour Included** — A tour through the Westinghouse Buffalo plant will include visits to the experimental laboratory, and new control assemblies, motor assembly and copper wire drawing departments.

Tell Berna, NMTBA, will report on the machine tool industry.



NEW EQUIPMENT: Three new annealing furnaces, a 54-inch cold reduction mill and other facilities have been installed at the Vandergrift plant of Carnegie-Illinois Steel Corp. to improve its production of silicon sheets. Photo shows the first annealing line to be completed

## Calendar of Meetings . . .

**Mar. 15-19, American Society of Tool Engineers:** Sixth industrial exposition and 16th annual convention, Public Auditorium, Cleveland. Society headquarters are at 1666 Penobscot Bldg., Detroit.

**Mar. 18-19, American Management Association:** Conference of manufacturers and distributors of industrial and consumer products to discuss American economy. Association headquarters are at 330 W. 42nd St., New York.

**Mar. 22-24, Chicago Technical Societies Council:** Chicago production show, Stevens Hotel. Executive secretary of the council is Paul A. Jenkins, 53 W. Jackson Blvd.

**Mar. 23, American Supply & Machinery Manufacturers' Association and National Supply & Machinery Distributors' Association:** Joint regional meeting, Palmer House, Chicago.

**Apr. 5-8, Southern Machinery & Metals Exposition:** Atlanta Municipal Auditorium, Atlanta.

**Apr. 5-8, National Association of Corrosion Engineers:** Fourth annual conference and exhibition at Jefferson Hotel, St. Louis. Association headquarters are at 67 Wall St., New York.

**Apr. 7-9, Midwest Power Conference:** Tenth annual meeting sponsored by Illinois Institute of Technology at Sheraton Hotel, Chicago. Stanton E. Winston is conference director.

**Apr. 7-9, American Society of Civil Engineers:** Spring meeting, William Penn Hotel, Pittsburgh. Society headquarters are at 33 W. 39th St., New York.

**Apr. 7-9, American Gas Association:** Sales conference on industrial and commercial gas, Windsor, Ont., Canada. Association headquarters are at 420 Lexington Ave., New York.

**Apr. 12-14, Open Hearth Steel and Coke Oven, Blast Furnace and Raw Materials Committees, Iron & Steel Division, AIME:** 31st annual conference, William Penn Hotel, Pittsburgh.

**Apr. 14-17, Electrochemical Society:** Spring convention in the Deshler-Wallick Hotel, Columbus, O. Society secretary is R. M. Burns, 235 W. 102nd St., New York.

**Apr. 15-16, Metal Powder Association:** Fourth annual spring meeting and exhibit, Drake Hotel, Chicago. Association headquarters are at 420 Lexington Ave., New York.

**Apr. 15-16, American Zinc Institute Inc.:** Institute's Galvanizers Committee will hold 20th meeting, in St. Louis at Hotel Statler. Institute headquarters are at 60 E. 42nd St., New York.

## Packaging Forum Slated For Cleveland Apr. 26-30

Approximately 200 companies in the $7.5 billion packaging industry will participate in American Management Association's 17th annual packaging exposition and conference Apr. 26-30 at the Public Auditorium, Cleveland. Coincident with this event will be National Packaging Week.

# Bizonia's Steel Output To Go Up

## Control authorities raise German goal to six million tons a year and seek to solve materials shortages. Tempo of dismantling increases

*DUSSELDORF, GERMANY*

AFTER prolonged discussions, the Allied control authorities in Germany have raised the target of steel production for this year from 4.8 million tons to 6 million tons, with the latter figure indicated as a minimum rather than a maximum amount.

To produce this tonnage, they estimate four million tons of Swedish iron ore must be imported, and sufficient foreign exchange for this purpose is to be released. Ores from other countries will also be imported if possible, although foreign ore producers generally are heavily booked.

The problems of supply of sufficient coal, gas, electricity, labor, transportation, etc. will also have to be solved before production can meet the newly established goal, but conferences between German and Anglo-American officials are taking place regularly to find ways to overcome these difficulties.

Meanwhile, steel production has shown gains since the first of the year, with 304,042 tons produced in January, compared with 287,713 tons in December. Pig iron production and domestic ore output were also up. Rolling mills have been able to boost their production, too, as more electricity has been available, although gas continues in short supply.

**Iron, Steel Association Revived**—The German Iron & Steel Association, which was once a powerful instrument of German heavy industry and had been reduced to a rather shadowy existence in 1945, has been reorganized, and has been strengthened by the joining of all the new independent steel companies.

New president of the association is C. Barich, of Huettenwerk Geisweid A. G., a newly organized steel firm at Siegen, and a new board of directors has been elected.

The organization, which is voluntary in character, intends to promote the technical and economic interests of its members, according to the president, and will refrain from all political issues. It is not to be used as an employers' organization, a political instrument, nor a camouflaged cartel.

**Dismantlings Continue** — Although much has been heard about a general stoppage of plant dismantling in Bizonia, the actual dismantling process has not only been speeded up in the British zone but has also been increased in scope.

In quite a few cases plants now are being torn down which were not included in the "final" list published last fall, and in many plants more machines are being taken away than were originally called for. The situation intensifies the German feeling of insecurity and is strangling what is left of private initiative.

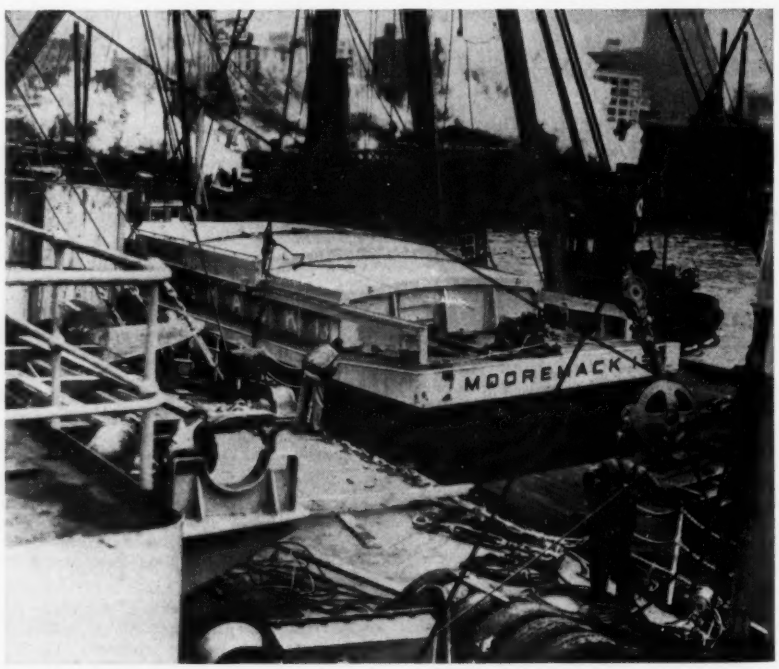
Outstanding example of what is happening to German industry is provided by the Watenstedt steel plant of the Reichswerke A. G. Herrman Goering at Salzgitter, a plant which processed low-grade ores. Part of this plant had originally been scheduled for removal, but quite suddenly a new list of facilities to be dismantled was published in mid-February. This included additional coke ovens, a forging plant, ore concentrators and other equipment.

The dismantling will require at least 3000 men, and, with a delegation from eleven countries expected to supervise the task, a speedup in the procedure is anticipated.

Because this plant could produce steel with domestic ores, and because higher grade ores have been difficult to obtain, it seems logical continued production from this plant would have helped European reconstruction in some measure and would have decreased the foreign exchange problem of the Allies.

**Motives Not Clear**—A close inspection of the dismantling lists and of the actual carrying out of the removals shows that purely strategic and purely competitive motives are being mixed together. In general those plants are most severely affected which produce either capital goods or consumers goods of the modern technical variety like automobiles, tractors, etc. The industries which could be regarded as the most hopeful from the export standpoint, thus, are the ones hardest hit, whereas the more backward industries, with less export potential, are least affected.

The steel industry, for example, is much concerned about the dismantling of foundries which produce rollers. There are 11 roller foundries in the British zone, eight of which are located in the Siegen district. Their rollers at one time




LIGHTERAGE BARGE: To solve many of the problems of handling cargo to and from ships anchored in open water where pier facilities are limited, a new type of lighterage barge, featuring a weathertight, full-opening hatch cover has been developd for Moore-McCormack Lines by Dravo Corp., Pittsburgh. Photo shows one of ten completed barges being hoisted aboard ship for shipment to Buenos Aires

were used by a large part of Europe's steel and paper industries. They are also the only source of rollers for Germany now, since all roller foundries in the eastern part of the country have been taken away by the Russians.

Some of these plants have lathes and milling machines of a special type and size which are not available elsewhere, in addition to their grinding machines for production of special rollers for the steel industry.

According to the "final" dismantling list, 24 roller-making machines were to be removed, but recently the number was raised to 38, which means that some important types of rolls will no longer be produced in the district. In some cases, furthermore, all milling machines will be taken away, which will entirely eliminate those plants from the industry.

**American Idea Well Received—** The report to the U. S. House of Representatives concerning the European Recovery Program, which proposes return in Germany of a free enterprise system and suggests the establishment of an international corporation in the Ruhr affording private capital for investment and allowing participation of German and foreign companies and of the German government, has been enthusiastically received here. Industry spokesmen think it may lessen the danger of nationalization. Trade unions are protesting such an arrangement and some talk about "international monopolists from the U. S. taking charge of the Ruhr" is heard, but the steel industry welcomes the proposal.

The American proposal is much preferred to suggestions from the French that a large part of the Ruhr steel industry be moved and the district turned into a processing plant for French steel.

## I T & T Consolidates Foreign Operations

In a move to consolidate its manufacturing activities abroad with those in the United States, International Telephone & Telegraph Corp. has announced acquisition of International Standard Electric Corp. by Federal Telephone & Radio Corp. Both companies are subsidiaries of I. T. & T.

With the acquisition of ISE's stock, Federal will assume control of I. T. & T.'s major manufacturing subsidiaries, including more than 30 wholly-owned factories in 24 different countries. When negotiations are completed, capitalization of the combined organization will total approximately $100 million.

# Europe Co-operation Increases

### Higher steel output projected on the continent as result of mutual aid in breaking bottlenecks. New steelworks planned. Trade agreements numerous

REPRESENTATIVES of the European steel industry, conferring in Geneva, Switzerland, recently, arranged for allocation of additional tonnages of blast furnace coke to Belgium, Luxemburg, France, Italy, Norway and Sweden so as to bring about an increase in crude steel output in 1948 of 1.5 million metric tons.

Much of the extra coke would come from the Ruhr, where efforts are being made to raise the level of production. Other countries which are to supply coking coal will have less coal available for domestic needs as a result, but are hoping the deficits can be made up by imports from Great Britain.

On the basis of estimates made to the economic commission for Europe, steel requirements for Europe, excluding Germany and Russia, amount to 45 million tons. Countries participating in the commission produced in excess of 32 million tons in 1947, but their aggregate capacity totals approximately 41 million tons. Raw materials shortages, however, will keep capacity operations from being attained.

### Belgium, Luxemburg

American methods for cold-rolling sheet and making tin plate will be used in a newly formed steel company, S. A. Compagnie des Fers Blancs et Tubes a Froid. The company, which will be known as Ferblati, is capitalized at $5,114,000, and was organized by the John Cockerill Co. at Seraing, near Liege, Belgium, with the banking concern, Societe Generale de Belgique, the Toleries Delloye-Matthieu, sheet manufacturer, and the Union Financiere et Industrielle Liegeoise, a financing organization, participating.

Some equipment for the new company will be purchased in the United States with the remainder, particularly electrical equipment, to come from Belgium. The plant will be located at Tilleur, near the Cockerill works.

Other expansions announced recently include new blast furnace with a rated capacity of about 3000 tons per week being erected at the works of Thy-le-Chateau and a modern blooming mill and modernization of plate and sheet mills by the Ougree-Marihaye concern.

Under a commercial agreement concluded recently with Sweden, the Belgo-Luxemburg Union will receive 2.6 million tons of Swedish iron ore over the next year. An agreement signed with Great Britain provides for larger shipments of Belgian steel in return for more British coal.

Russian pig iron is reportedly being shipped to Belgium at about $27 per ton higher than the price of Luxemburgian iron, but Belgian foundries are so short of iron they are paying the premium.

### France

Plans for extension and modernization of French steelworks are proceeding. Acieries de Longway has ordered a blast furnace for its works at Mont St. Martin and coke oven batteries for that facility and for its Thionville plant. The company now operates five blast furnaces, five open hearths and one electric furnace.

Merger of Denain-Anzin and Acieries du Nord et de l'Est, where a modern American strip mill is being installed, has been announced, with the resulting company called Union Siderurgieque du Nord de la France.

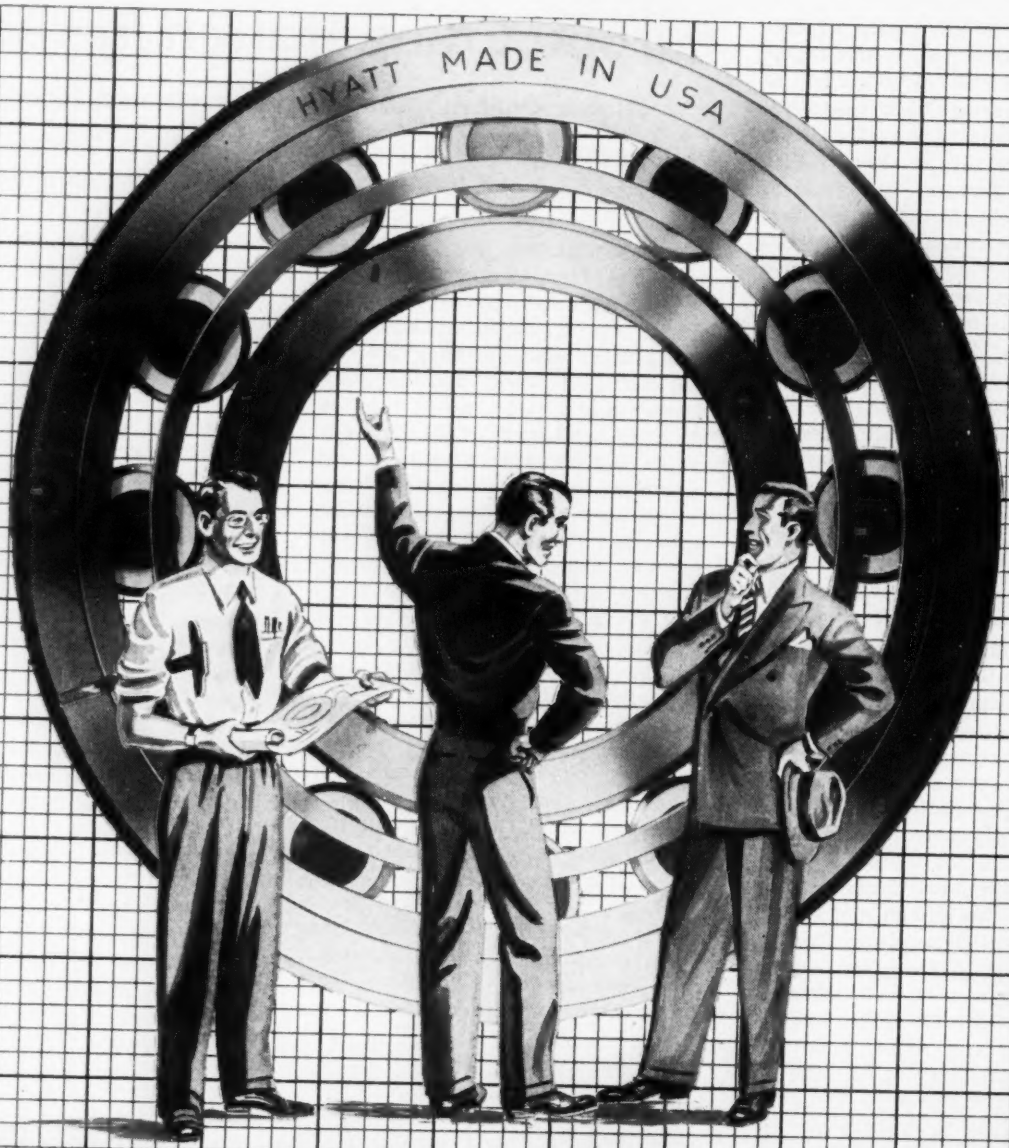
Most of the equipment for the new sheet mill at Forges d'Audincourt has arrived from the United States, and it is hoped production will commence by the end of the year on types of sheets not now produced in France.

Allocation of steel to consumers this year is based on production targets of 1.5 million tons a quarter, but for the current quarter steel users will receive only 1,350,000 tons.

### Sweden

Exports of Swedish iron ore in 1947 were 8,451,000 tons, compared with 5,316,000 tons in 1946. Production of pig iron last year was 690,000 tons, compared with 686,000 tons in 1946 and 691,000 tons in 1939. Output of steel ingots and castings was 1,186,000 tons last year, against 1,203,000 tons in 1946 and 1,152,000 tons in 1939.

Increased trade between Sweden and Finland is expected to result from a trade agreement signed recently. Provision for about $14,600,000 of Swedish exports and $16,400,000 of imports from Finland is included. Swedish exports will include iron ore, iron and steel and other metal products, ball bearings, motors, telephone and telegraph apparatus and chemicals.

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## HYATT ROLLER BEARINGS

By A. H. ALLEN *Detroit Editor, STEEL*

# Mirrors of Motordom

**Little hope held for restoration of export trade with Canada during 1948. Ford Motor of Canada president explains necessity for restrictions on imports from U.S.**

*DETROIT*

AUTOMOTIVE suppliers hopeful of restoration of Canadian export business, cut back sharply the first of the year, are doomed to disappointment as far as 1948 is concerned, but the Dominion outlook is not as bleak as it has been painted, being much more of an exchange conservation than an "austerity" program as described in some quarters. Illuminating comment on the situation there, as it applies to automobile manufacturing, was presented in an address here last week by Douglas B. Greig, president of Ford Motor of Canada.

He prefaced his remarks by noting that thick, juicy steaks and good roast beef are still plentiful in Canada, and at attractive prices—hopeful bait for tourists who may have been scared away by "austerity" talk. American visitors spent $220 million there last year and their business is still urgently needed since every dollar spent on business and pleasure means one more dollar that can be used to do business with U. S. suppliers.

In the effort to conserve outflow of U. S. dollars, the Canadian government took two steps which it did not like but which seemed imperative—prohibiting or placing under quota the import of goods which had to be paid for in dollars, and levying high taxes on goods containing a high percentage of parts or materials from the U. S. to make them unattractive to the Canadian buyer. As the program developed more emphasis was placed upon import restrictions than on special taxes.

**Budget Is Balanced**—The problem, as Mr. Greig emphasized, is not one of poverty, since the Dominion economy is entirely sound, with a ten-month surplus in the last fiscal year of $741 million, of which $357 million is cash. The budget is balanced. Private investment climbed from $900 million in 1939 to $2.75 billion last year. Employment is up 70 per cent from 1939. The trouble is that Canada was spending $2 billion annually in the U. S., or $220 per capita, while the U. S. was spending only $1 billion in Canada, or $12 per capita. Prior to the war this trade deficit was made up through exports to England, the British Commonwealth and Europe, pipelines which have dried up since the war, again mainly as a result of no U. S. dollars. Meanwhile Canada during the war years made loans and advances of $2 billion, gave outright to Great Britain $1 billion and extended postwar loans to a number of countries totaling another $2 billion. Rising prices in the U. S. accelerated the outgo of dollars from the Dominion.

## Automobile Production

**Passenger Cars and Trucks—U. S. and Canada**

| | 1948 | 1947 |
|---|---|---|
| January | 442,930* | 366,205 |
| February | 396,674* | 393,636 |
| March | | 443,588 |
| April | | 445,137 |
| May | | 404,191 |
| June | | 421,466 |
| July | | 400,944 |
| August | | 364,478 |
| September | | 444,501 |
| October | | 461,536 |
| November | | 417,493 |
| December | | 492,109 |
| 12 mos. | | 5,055,284 |

* Preliminary.

**Estimates for week ended:**

| | 1948 | 1947 |
|---|---|---|
| Feb. 21 | 110,536 | 103,400 |
| Feb. 28 | 120,130 | 105,175 |
| Mar. 6 | 108,700 | 104,378 |
| Mar. 13 | 110,000 | 105,496 |

*Estimates by Ward's Automotive Reports*

**Imports Limited**—Canadian manufacturers and importers of automobiles now follow certain ground rules established by the government. Essential basis is the average dollar value of materials and parts imported from the U. S. for use in a Canadian-built automobile. In application the formula works out, according to Mr. Greig, about as follows: For every complete car brought into Canada by an importer during the 12 months ended Oct. 31 last he is allotted $230 to spend across the border. Since he needs something close to $1500 to import one complete car, his imports obviously will be substantially reduced, probably to only 15 per cent of the free-commerce volume. The same basis formula applies to the number of dollars to be allocated to the Canadian auto manufacturer who normally requires about $307 worth of U. S. parts and materials. This figure has been cut sharply, so unless the manufacturer can develop sources of parts supply in Canada or unless he finds some other means to build dollar credits he is not going to be able to produce as many cars.

**Seeks Canadian Sources**—Ford of Canada is doing everything it can to contribute to the solution of the Canadian exchange problem. First, it is concentrating upon lines of cars which have the smallest U. S. dollar content, dropping models which are above average in this respect. Purchases of U. S. accessories and equipment are being scaled back or eliminated. Inquiries are being pushed energetically toward lining up additional supplies from Canadian sources. A company there is now tooling production of fuel and vacuum pumps of Ford design. Gaskets are being bought in Canada. Negotiations are under way for manufacture in Canada of two-speed axles, and a source has been located for arm rests, formerly imported. A hunt is on for suppliers who might furnish other requirements, such as steering wheels, electrical cables, hinges, horns and lenses. Dollar credits are being reinforced by the sale of a substantial volume of gray iron castings to Ford Motor in the U. S.

Mr. Greig concluded his remarks by declaring, "Canada is continuing to meet her problems in a democratic manner. We are facing our difficulties as a vigorous, successful, free people. We are submitting to control and regimentation only on a temporary basis. We don't like to do what we have to do, but we are determined to do the job that needs to be done. Our fundamental problem is not in Canada but in the United Kingdom, in the Commonwealth countries and in Europe."

## Blending Alcohol, Gasoline

The old ballyhoo for the mixture of grain alcohol with gasoline as an outlet for potential farm surpluses

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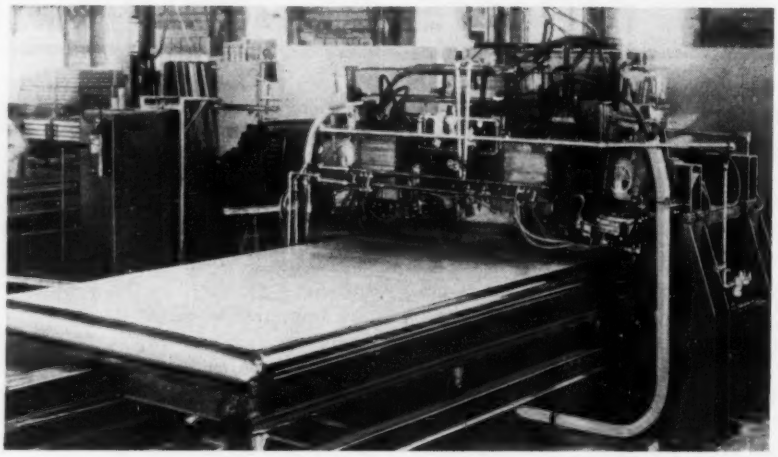


SEAM WELDER: Fruehauf Trailer Co.'s Kansas City plant is rapidly expanding production of all-steel truck bodies, will reach 1000 a month as soon as steel shortages are overcome. This automatic seam welder electrically welds roof panels to frames

has been trumpeted again, but with a new twist, by Dr. G. E. Hilbert, director of the Northern Regional Research Laboratory of the Agriculture Department, Peoria, Ill., speaking before the National Farm Chemurgic Council in Omaha recently. Trend of the automotive industry toward engines with higher compression ratio, an established fact, impresses Dr. Hilbert as a factor favoring the use of alcohol injection or admixture since such engines require fuel with much higher octane rating than now available and the addition of 10-25 per cent alcohol to present gasolines appears to yield such high-octane fuel. As a motor fuel, alcohol approaches iso-octane, or 100, octane rating and will increase the octane rating of any fuel whose octane number is less than 92. For example, a gasoline with octane rating of 60, if blended with 25 per cent Ethyl alcohol, produces a motor fuel with the substantially increased octane rating of 79.

Success of alcohol-water injection systems in military aircraft engines for brief periods of "burst" power is well known and in recent years a device has been perfected for adapting this type of injection to truck engines. Both these developments have stimulated research into production of alcohol from grain and farm residues. Drawback at the moment is price, since even with $1 corn, the derived alcohol will cost 50 cents a gallon. Progress is being made with investigations of farm residues, such as corn cobs, sugar cane bagasse, and flax shives. Currently the residue under study is corn cobs and another year will be required to evaluate fully the cost factors, a principal one being transportation of the raw material.

## Scrap Drive Encouraging

Reports coming in to General Motors on the progress of its campaign to stimulate collection of idle scrap metal are encouraging and further moderation in the weather should accelerate the activity. Scores of civic and charitable organizations, suppliers, dealers, and even other automobile manufacturers (Willys-Overland) are co-operating.

Apparently there has been no reflection of this sponsored scrap collection plan in steel deliveries to GM divisions, for car and truck assemblies took an unexpected nosedive week before last, falling off about 11,500 units, principally the result of cutbacks by Chevrolet and Buick, necessitated by shortages of sheet steel.

General Motors built 168,446 cars and trucks in the U. S. and Canada during February, just 522 fewer than were assembled in January and bringing the two-month total to 337,414, compared with 281,180 for the same period of 1947. Truck production in February accounted for 22.7 per cent of the total. GM is holding its own or better in percentage of total cars and trucks built by the industry, February output figuring to better than 42 per cent.

## New Lincolns Coming

Model changeover activity at the Lincoln Division of Ford was practically completed the first of the month, and first "teaser" ads for the 1949 series have appeared, announcing eight body styles in two separate price ranges, one to be simply the Lincoln and the other the Lincoln Cosmopolitan. Dealers will have cars in a few weeks, completely new from roof to road and featuring V-8 engine of around 145 horsepower.

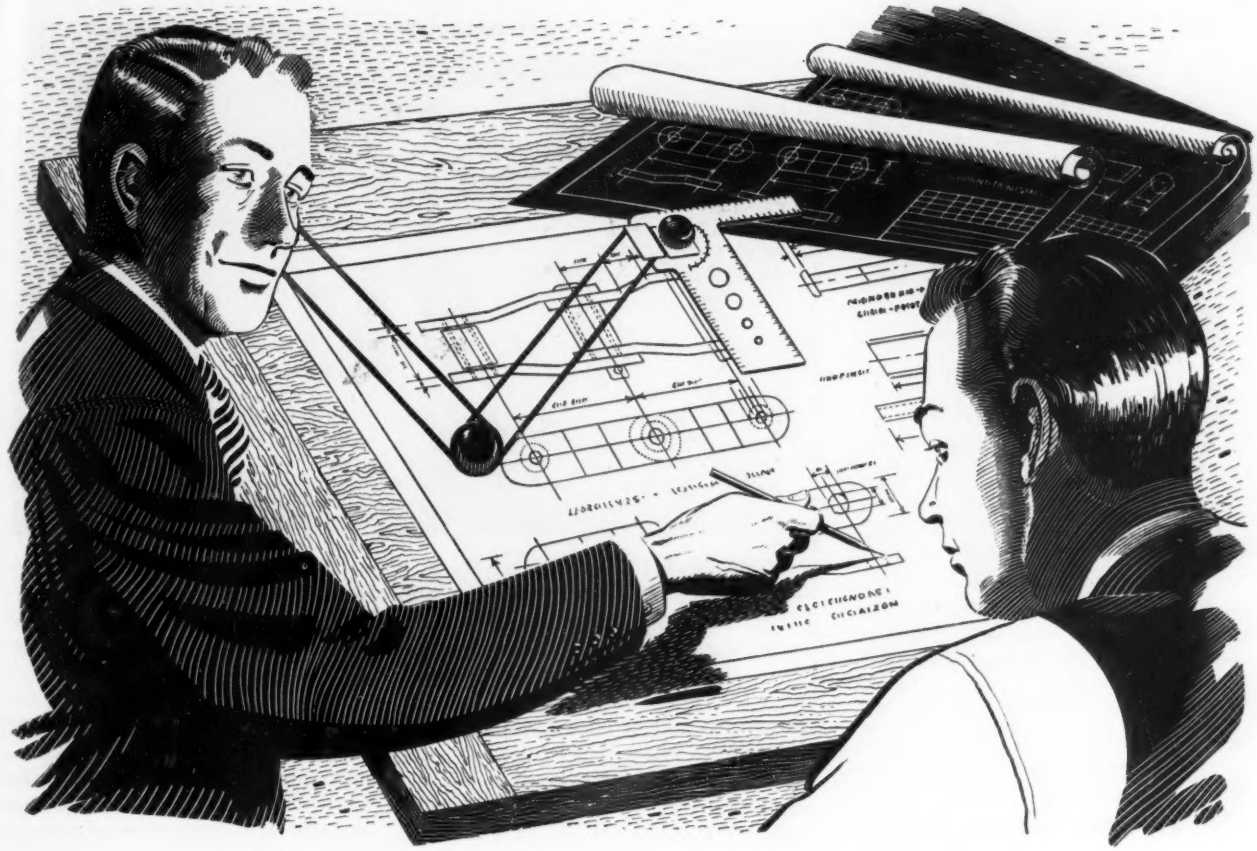
At the Rouge Ford plant, layoffs for the model change are hitting 20-25,000 employees, most for not longer than two weeks and few for more than six weeks. The plant is expected to be refitted completely by May 1. Throughout the company's 14 assembly plants, an additional 8000 production employees will face 2-6 week layoffs, only 450 will be affected at the Highland Park Plant where 11,000 are employed, and none in 12 parts depots. A second shift has been added to the truck assembly line at Highland Park and production stepped up from 220 to better than 300 daily. Total Ford production for the first two months of the year, including tractors, exceeded 190,000, or about 21 per cent of the industry total on cars and trucks.

## Expands Development Section

Fisher Body Division of GM has accomplished a considerable expansion of its experimental and development section since 1945, now employing about 200 young engineers in this work and devoting 80,000 square feet of floor space in a Detroit plant to their studies. Many of the technicians have had experience in aircraft stress analysis and are bringing new procedures to the study of automobile body structures under torsion, impact, bending and the like, making extensive use of electric strain gages and other delicate recording instruments.

## Converting Loss to Profit

How to convert a factory operating loss of close to $5 million, on production of 55,477 cars, into a net income of $1.1 million and an addition to earned surplus of $3.9 million is demonstrated by Packard accounting specialists. First, Packard zone offices, sales branches and subsidiaries contributed a profit of over $3.4 million, a 34.5 per cent gain over 1946. Then an estimated refund of $2.6 million in federal income taxes from previous years was credited. And finally $2.8 million in reserves provided in prior years and no longer required was transferred to earned surplus. So, total capital and surplus increased to better than $60.5 million, equivalent to $4.04 on each of 15 million common shares outstanding. Inventories, incidentally, advanced in 1947 to approximately $21 million.



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★

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# Building Costs Hit Allegheny Ludlum Corp.

ALLEGHENY Ludlum Steel Corp., Brackenridge, Pa., expects its plant improvement program, under way since August, 1945, will involve $24 million in contrast to $15 millon as originally planned.

The company has mailed proxies to stockholders for authorization to incur indebtedness up to $20 million for financing the program. Annual stockholders' meeting is scheduled Apr. 30. Stockholders have authorized issuance of 200,000 shares of cumulative preferred stock and additional common, but directors decided not to offer the issue at this time in view of the uncertain market conditions. The plan to issue additional stock would be dropped should the $20 million be raised through bank loans. At present the company has only common stock and no indebtedness.

**New Production Methods**—Installation of new equipment is planned to take advantage of developments in steelmaking—such as use of oxygen in melting steel and the new electric melting process for production of stainless steel.

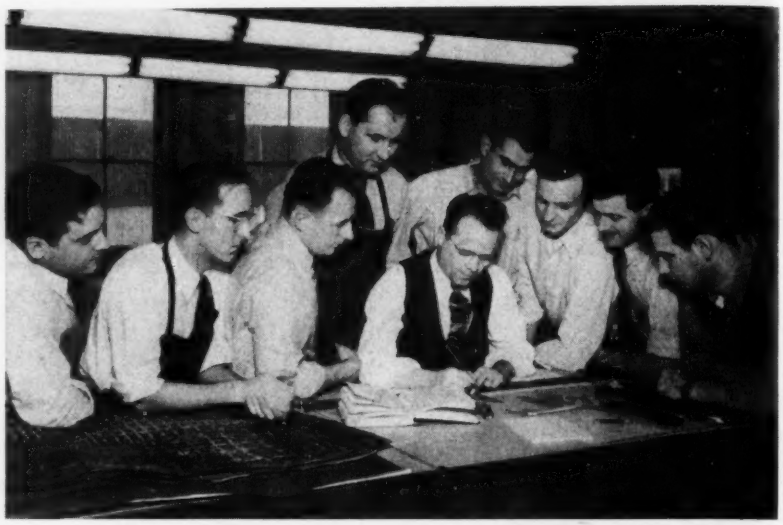
A modern blooming mill is on order, and delivery is expected some time in 1949. The new unit will replace the present steam-driven mill at Brackenridge and is expected to result in lower operating costs and greater production. A 50-ton electric melting furnace has recently been put in operation at this facility, as well as a slab reheating furnace to improve the quality and increase the range of products made on the blooming mill and continuous hot strip mills.

**Strip Mill in Operation** — The company has also recently put into operation a 28-in. cold-reduction mill at West Leechburg, Pa., for silicon and stainless strip. The project at this plant is incomplete. Plans call for installation of new electrolytic equipment some time this year, designed to improve production of copper-coated carbon steel strip and to increase the capacity for that product.

The general program also involves modernization of bar rolling facilities for stainless steel, valve steel and high temperature alloys at Watervliet, N. Y. A new blooming mill is on order for this plant and is expected to be completed in 1949. Consolidation, improvement and expansion of facilities for production of stainless wire at Brigham Road plant in Dunkirk, N. Y., is also under way. At both Watervliet and Dunkirk, electric hot top equipment has been installed to take advantage of a new method for increasing the yield from ingots.

**Supplemental Projects** — A supplemental part of the overall program includes modernization and widening of the continuous hot strip mill at Brackenridge and changes in the sheet rolling facilities to take advantage of the greater widths of hot-rolled bands that could then be produced. This phase of the program will be under way into 1950. It includes also a new cold strip mill at Leechburg (not ordered as yet) to provide further for the increased demand for coiled strip and a new building and equipment for stainless strip-grinding.

At Watervliet and Dunkirk, changes are contemplated in the melting and finishing departments, and a number of small projects, all designed to improve operations, are planned. Provision is also made in the supplemental program for the construction and equipping of a new laboratory at Brackenridge.



**GI'S LEARN DRAFTING: K. C. Pyne, seated, outlines drafting room practice to a group of veterans who are student-apprentices at the plant of the Lehigh Structural Steel Co., Allentown, Pa. Facing a shortage of trained draftsmen, the company instituted a plan whereby local schools are helping to train ex-service men to fill the need**

## National Screw Expands, Acquires Hodell Chain Co.

National Screw & Mfg. Co. has acquired Hodell Chain Co. Both firms are located in Cleveland.

Stockholders have approved the move and final details are now being worked out. National Screw is a manufacturer of bolts, nuts, screws and other industrial fasteners, while Hodell makes welded and weldless chain. Commercial advantages to be gained by the merger, according to a statement by National Screw, are that the raw material is similar in both companies, and also that the two lines of products are distributed in much the same manner.

Fred G. Hodell, president of Hodell Chain, will remain with the organization and be in charge of Hodell Chain Division operations. This is the second time in recent months that National Screw has expanded its line of products. In January it purchased Chester Hoist Co., Lisbon, O., manufacturer of chain hoists and trolleys, which is being operated as Chester Hoist Division.

## GE, Alco Show New Locomotive Gas Turbine

Developmental locomotive gas turbine was demonstrated to railroad officials, technical men and editors at an exhibit sponsored by General Electric Co. and the American Locomotive Co. at Schenectady, N. Y., Mar. 2 and 3.

Nineteen feet long and weighing nearly 10 tons, the locomotive gas turbine, as already developed, conceivably could be installed in one unit. It burns bunker "C" fuel, a low-grade fuel oil, but can be adapted for the use of pulverized coal.

# Briefs . . . .

## Paragraph mentions of developments of interest and significance within the metalworking industry

**Albertson Electric Co.,** Milwaukee, manufacturer of electric power and distribution transformers, has been acquired by a Milwaukee group headed by Harold V. Schoenecker who will be president of the company.

—o—

**Chicago Association of Commerce & Industry** reports industrial developments in the Chicago area, in the form of new construction and expansions of plant facilities and acquisitions of land and buildings, amounted to $15,270,000 in February, compared with $14,210,000 in February, 1947.

—o—

**National Electric Products Corp.,** Ambridge, Pa., has purchased the Joshua Hendy Iron Works plant at Torrance, Calif. Facility will be equipped for manufacture of flexible electrical conduit, tubing and electrical fittings.

—o—

**Mack Trucks Inc.,** New York, manufactured 20,876 trucks, busses and fire apparatus units in 1947, largest production in the company's 47-year history.

—o—

**Alabama Power Co.,** Birmingham, will renew experiments in underground gasification of coal at its Gorgas, Ala., mine in co-operation with the Bureau of Mines. The new experiments, expected to start within 60 days, will involve an expenditure of between $350,000 and $500,000.

—o—

**Wyman-Gordan Co.,** Worcester, Mass., has purchased from War Assets Administration drop hammer steel forging facilities at Harvey, Ill., which it operated during the war, for $2,671,025.

—o—

**Link-Belt Co.,** Chicago, manufacturer of power transmission and materials handling equipment, has established a district sales office at 617 Johnston Bldg., Charlotte, N. C., with Thomas H. Appleton as district sales manager.

—o—

**Adirondack Foundries & Steel Inc.,** Watervliet, N. Y., has purchased from War Assets Administration an iron and steel foundry at Watervliet for $257,000. Company will spend about $270,000 to convert the property to the production of castings.

—o—

**Allis-Chalmers Mfg. Co.,** Milwaukee, will distribute the high frequency heating equipment and metal detectors manufactured by RCA Victor Division of Radio Corp. of America, in addition to its own regular line of electronic heating equipment.

—o—

**Reltool Corp.,** Milwaukee, has appointed Walter E. Winfrey Co., Cambridge, Mass., as sales representative for Reltool metal cutting tools in eastern Massachusetts, Rhode Island, New Hampshire and Maine.

—o—

**Baker Industrial Truck Division,** Cleveland, Baker-Raulang Co., maker of materials handling equipment, has appointed Hooper-Green Co., Indianapolis, as district sales representative for Indiana.

—o—

**Arkansas Power & Light Co.,** Little Rock, Ark., plans to buy an unfinished steam electric generating plant on Lake Catherine in Arkansas from War Assets Administration for $925,000. Facility, to be completed at a cost of $8 million, will supply power to the Jones Mills aluminum plant of Reynolds Metals Co.

—o—

**Southern States Iron Roofing Co.,** Savannah, Ga., manufacturer of roofing, pre-fabricated buildings and other products, has eliminated its Mail Order Division. Firm's line will be sold through dealers.

—o—

**Office of Small Business,** Department of Commerce, has issued "Patents Available for License and Sale," the first in a series of Small Business Aids designed to explain service and facilities of the Patent Office and patents available to small business.

—o—

**National Research Corp.,** research and development firm specializing in the high vacuum field, has moved to 70 Memorial Dr., Cambridge, Mass.

—o—

**Federal Products Corp.,** Providence, R. I., manufacturer of precision measuring instruments, has purchased all rights and physical equipment for the manufacture of electronic gage circuits formerly designed and manufactured by Foote, Pierson & Co. Inc., Newark, N. J.

—o—

**General Electric Co.,** Schenectady, N. Y., has begun shipments from its plastics molding plant at Decatur, Ill. This is GE's sixth plastics facility, and was purchased last year from War Assets Administration.

—o—

**Progressive Welder Co.,** Detroit, producer of resistance welding equipment, has named as sales representative the newly formed Tri-Line Corp., Buffalo, Rochester and Syracuse, N. Y.

—o—

**War Assets Administration** has sold the Ozark Ordnance Works at El Dorado, Ark., to Lion Oil Co. for $10,500,000.

—o—

**Cochrane Corp.,** Philadelphia, has appointed Henry P. Thompson Co., Cincinnati, as sales and engineering representative for its complete line of water conditioning equipment and steam specialties in western Ohio, eastern Kentucky and parts of Indiana.

—o—

**Department of Commerce** predicts that, barring economic recession, California in 1948 will chalk up a new construction record with a total of about $2.4 billion. New construction throughout the country in 1948 is expected to aggregate $15.2 billion.

—o—

**Pullman-Standard Car Mfg. Co.,** Chicago, built 2707 freight cars in February, a postwar peak.

—o—

**Thew Shovel Co.,** Lorain, O., manufacturer of power cranes and shovels, has produced a 16 mm sound film entitled "It's Your Move," which depicts applications of its products.

—o—

**American Standards Association,** New York, has published a safety code for the construction and operation of mechanical conveyors and conveying equipment.

—o—

**Landis Tool Co.,** Waynesboro, Pa., manufacturer of precision grinding machines, has appointed K. P. Wesseling Co., St. Louis, as its sales distributor in eastern Missouri and southern Illinois.

—o—

**Hagan Corp.,** Pittsburgh, combustion and chemical engineering firm, has opened a branch office in the Defense Bldg., Washington. Louis R. Caplan is manager. The office which will also handle sales for Hagan associated companies — Hall Laboratories, Calgon Inc. and Buromin Co.— has as its territory District of Columbia, Maryland, Virginia and West Virginia.

—o—

**Department of Commerce** has established the April allocation of coal for overseas export at 445 cargoes, amounting to 4 million gross tons.

# The Business Trend

FORECASTS at the beginning of this year indicated production by the metalworking industries could rival the peacetime records of 1947 and might surpass those peaks, barring onset of deflationary influences. These prognostications appear good in view of production figures to date in various segments of the metalworking field.

STEEL's index of industrial activity so far this year has shown only one week in which operations dropped to the 1947 level, that exception occurring when severe winter weather adversely affected nearly all basic industries. In the latest week, which ended Mar. 6, STEEL's index, at 167 per cent (preliminary) of the 1936-1939 weekly average, was seven points higher than for the like week a year ago.

Growing caution in buying habits at the plant level and some cutbacks in production indicate pipelines in some products have filled and some of the push behind the upward production trend may have been spent, however.

**AUTOS**—Shortage of steel continues to hamper auto builders' operations. General Motors in the week ended Mar. 6 turned out only 39,720 cars and trucks at United States plants, compared with 47,900 in the previous week, with the decrease attributed to insufficiency of steel. Total U. S. and Canadian production was estimated at 108,700 units, from 120,130 a week earlier.

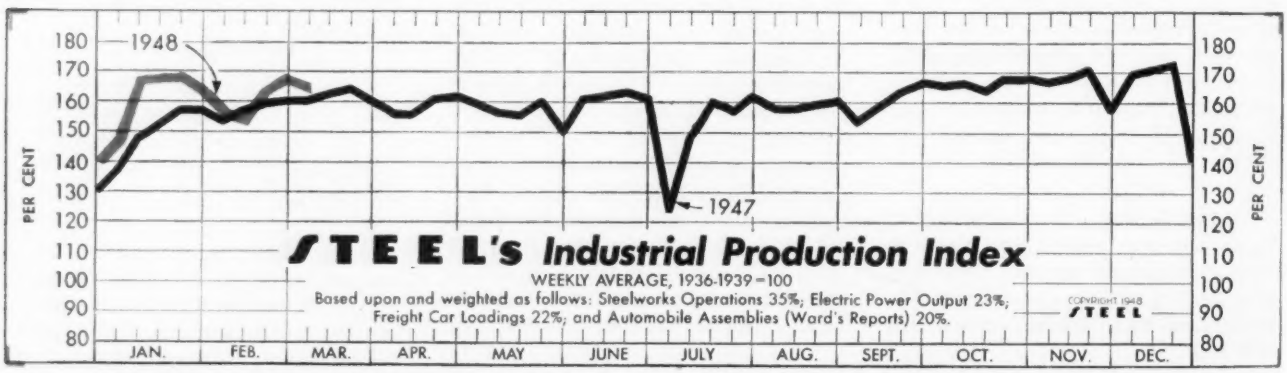
**STEEL**—A one-point gain in the steel ingot rate in the week ended Mar. 6 brought operations to 94.5 per cent of capacity, and outlook for higher production in second quarter is favorable, barring labor trouble. Still uncertain, however, is the effect voluntary allocations will have on availability of steel to nonpreferential consumers.

**COAL**—Industrial use and retail deliveries of bituminous coal and lignite in January increased 6.3 per cent over December, while stocks held by plants and by retailers declined 3.8 per cent and 31.7 per cent, respectively.

**MANUFACTURING**—Although manufacturers' sales in January were about 3 per cent less than in December, aggregating $15.3 billion, the decline was the smallest for the season in the last ten years, according to the Department of Commerce. The entire decline occurred in durable goods. Inventories of durable goods producers rose to $12.4 billion from $12.3 billion at the end of December.

**ELECTRICITY**—The highest monthly production of electricity on record occurred in January, Federal Power Commission states, with 23,958 million kilowatt-hours produced. This total exceeds by 10.7 per cent that for January, 1947, and by 1.9 per cent the previous high in December.

**NEW BUSINESS**—More new businesses were incorporated in January than at any time since the like month a year ago, Dun & Bradstreet Inc. reports. The total of 11,000 firms chartered in the latest month was 8.6 per cent higher than the December figure.




**Index (chart above): Week ended Mar. 6 (preliminary) 167 Previous Week 168 Month Ago 158 Year Ago 160**

## BAROMETERS of BUSINESS

| INDUSTRY | Latest Period* | Prior Week | Month Ago | Year Ago |
|---|---|---|---|---|
| Steel Ingot Output (per cent of capacity)† | 94.5 | 93.5 | 94.0 | 93.0 |
| Electric Power Distributed (million kilowatt hours) | 5,293 | 5,252 | 5,412 | 4,787 |
| Bituminous Coal Production (daily av.—1000 tons) | 2,150 | 2,140 | 1,890 | 2,110 |
| Petroleum Production (daily av.—1000 bbl.) | 5,353 | 5,387 | 5,332 | 4,824 |
| Construction Volume (ENR—Unit $1,000,000) | $183.9 | $128.7 | $123.8 | $127.9 |
| Automobile and Truck Output (Ward's—number units) | 108,700 | 120,130 | 82,717 | 104,378 |

* Dates on request. † 1948 weekly capacity is 1,802,476 net tons. 1947 weekly capacity was 1,749,928 net tons.

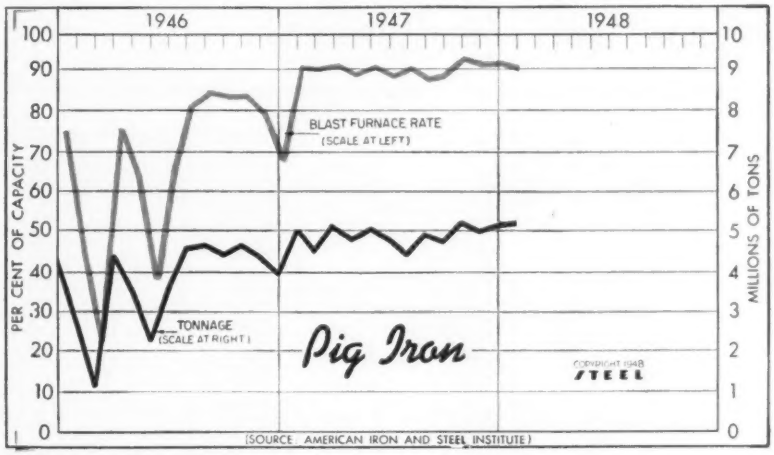
| TRADE | | | | |
|---|---|---|---|---|
| Freight Carloadings (unit—1000 cars) | 830† | 791 | 747 | 806 |
| Business Failures (Dun & Bradstreet, number) | 113 | 93 | 97 | 58 |
| Money in Circulation (in millions of dollars)‡ | $28,024 | $28,054 | $28,124 | $28,335 |
| Department Store Sales (change from like wk. a yr. ago.)‡ | +5% | +15% | +8% | +10% |

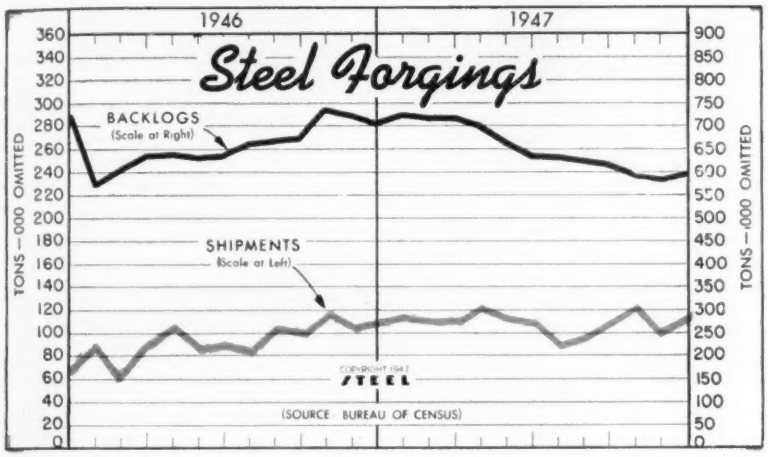
† Preliminary. ‡ Federal Reserve Board.

### Pig Iron*

| | Production (Net Tons—000) | | | Operating Rate (% of Capacity) | | |
|---|---|---|---|---|---|---|
| | 1948 | 1947 | 1946 | 1948 | 1947 | 1946 |
| Jan. | 5,194 | 5,071 | 2,644 | 90.9 | 90.8 | 47.4 |
| Feb. | .... | 4,550 | 1,148 | ... | 90.3 | 22.2 |
| Mar. | .... | 5,123 | 4,424 | ... | 91.8 | 77.3 |
| Apr. | .... | 4,830 | 3,614 | ... | 89.3 | 65.2 |
| May | .... | 5,081 | 2,274 | ... | 91.0 | 39.8 |
| June | .... | 4,810 | 3,682 | ... | 89.0 | 66.5 |
| July | .... | 4,585 | 4,705 | ... | 90.3 | 82.4 |
| Aug. | .... | 4,916 | 4,898 | ... | 88.1 | 85.6 |
| Sept. | .... | 4,801 | 4,687 | ... | 89.0 | 84.8 |
| Oct. | .... | 5,228 | 4,814 | ... | 93.6 | 84.1 |
| Nov. | .... | 5,015 | 4,435 | ... | 92.8 | 80.0 |
| Dec. | .... | 5,177 | 3,992 | ... | 92.9 | 69.9 |
| Total. | .... | 59,210 | 45,318 | Ave... | 90.1 | 67.4 |

* Includes ferromanganese and spiegeleisen.




### Steel Forgings

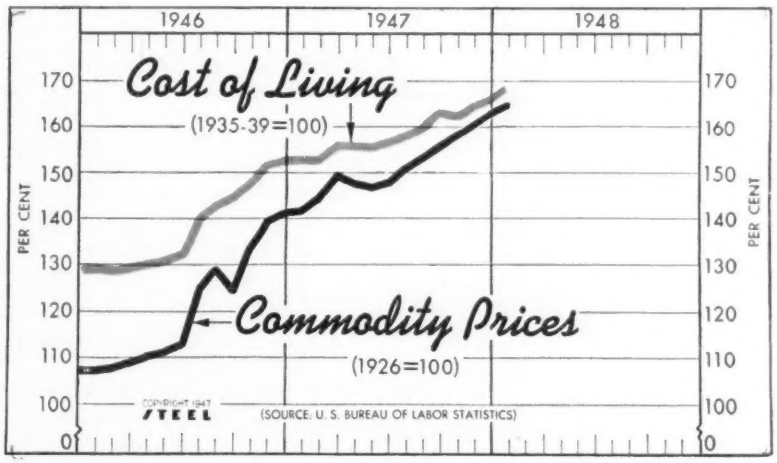
Tons—000 omitted

| | Shipments* | | Unfilled Orders* | |
|---|---|---|---|---|
| | 1947 | 1946 | 1947 | 1946 |
| January | 116 | 92 | 723 | 570 |
| February | 111 | 63 | 714 | 606 |
| March | 115 | 87 | 717 | 637 |
| April | 121 | 106 | 699 | 639 |
| May | 115 | 89 | 663 | 631 |
| June | 110 | 93 | 638 | 635 |
| July | 92 | 86 | 631 | 661 |
| August | 98 | 108 | 626 | 666 |
| September | 109 | 102 | 617 | 671 |
| October | 124 | 119 | 594 | 736 |
| November | 104 | 108 | 586 | 727 |
| December | 117 | 110 | 594 | 707 |

* Forgings for sale.

### Wholesale Commodity Price—Cost of Living Indexes

| | —Commodities— (1926=100) | | | —Living Cost— (1935-39=100) | | |
|---|---|---|---|---|---|---|
| | 1948 | 1947 | 1946 | 1948 | 1947 | 1946 |
| Jan. | 165.6 | 141.5 | 107.1 | 168.8 | 153.3 | 129.9 |
| Feb. | .... | 144.5 | 107.7 | .... | 153.2 | 129.6 |
| Mar. | .... | 149.5 | 108.9 | .... | 156.3 | 130.2 |
| Apr. | .... | 147.7 | 110.2 | .... | 156.2 | 131.1 |
| May | .... | 147.1 | 111.0 | .... | 156.0 | 131.7 |
| June | .... | 148.0 | 112.9 | .... | 157.1 | 133.3 |
| July | .... | 150.8 | 124.7 | .... | 158.4 | 141.2 |
| Aug. | .... | 153.6 | 129.1 | .... | 160.3 | 144.1 |
| Sept. | .... | 157.4 | 124.0 | .... | 163.8 | 145.9 |
| Oct. | .... | 158.5 | 134.1 | .... | 163.8 | 148.6 |
| Nov. | .... | 159.7 | 139.7 | .... | 164.9 | 152.2 |
| Dec. | .... | 163.2 | 140.9 | .... | 167.0 | 153.3 |
| Ave. | .... | 151.8 | 120.9 | .... | 159.2 | 139.3 |




## FINANCE

| | Latest Period* | Prior Week | Month Ago | Year Ago |
|---|---|---|---|---|
| Bank Clearings (Dun & Bradstreet—millions) | $14,442 | $11,712 | $14,265 | $13,988 |
| Federal Gross Debt (billions) | $254.2 | $254.7 | $254.8 | $260.7 |
| Bond Volume, NYSE (millions) | $18.6 | $15.6 | $20.8 | $19.9 |
| Stocks Sales, NYSE (thousands) | 3,827 | 3,092 | 5,126 | 5,321 |
| Loans and Investments (billions)† | $64.0 | $64.3 | $65.0 | $63.3 |
| United States Gov't. Obligations Held (millions)† | $36,281 | $36,634 | $37,323 | $39,619 |

† Member banks, Federal Reserve System.

## PRICES

| | | | | |
|---|---|---|---|---|
| STEEL's composite finished steel price average | $81.14 | $81.14 | $78.59 | $69.73 |
| All Commodities† | 159.2 | 159.2 | 163.7 | 146.4 |
| Industrial Raw Materials† | 173.9 | 173.6 | 182.3 | 158.9 |
| Manufactured Products† | 153.5 | 153.5 | 156.5 | 142.0 |

† Bureau of Labor Statistics Index, 1926=100.

# Men of Industry

ALLEN D. MESSNER

CLARK MOORE

J. H. DOWLING

**Allen D. Messner**, assistant to the president of Thompson Products Inc., Cleveland, has resigned to become president of Betz-Pierce Co., distributor of steel in northern Ohio. He succeeds the late **Ray D. Love.** Mr. Messner joined the legal department of Thompson Products in 1940, was active in the organization of the Tapco Plant in Euclid, O., and in August, 1946, was appointed to serve as assistant to **Frederick C. Crawford,** president.

—o—

Tube Reducing Corp., Stamford, Conn., has announced appointment of **John D. Judge** as executive vice president.

—o—

**Norman B. Johnson,** assistant executive vice president, Pullman-Standard Car Mfg. Co., Chicago, has been named to head all activities relating to operation of the Pullman Car Works, Chicago, passenger car division of the company.

—o—

**Raymond J. Hurley** has been elected chairman, Thor Corp., Chicago, succeeding his brother, the late **Edward N. Hurley Jr.** The new chairman has been a director of the company, formerly the Hurley Machine Division, Electric Household Utilities Corp.

—o—

**Richard Wellbrock,** sales manager, New Jersey Machine Corp., Hoboken, N. J., has been elected a vice president of the corporation in charge of sales. **Richard Dede,** production manager, has been made vice president in charge of production.

—o—

**John I. Snyder Jr.,** chairman of the board of Pressed Steel Car Co. Inc., Pittsburgh, has been elected president of the company to succeed **Ernest Murphy,** who has resigned as president and a director. **W. T. Kilborn,** president of the Flannery Bolt Co., has been elected a director and chairman of the executive committee of Pressed Steel Car Co. Inc.

—o—

**Clark Moore** has been appointed manager of sales for Optimus Detergents Co., Matawan, N. J. He has been sales manager of the Asphalt Paving and Industrial Sales Divisions of Barber Asphalt Corp., Barber, N. J. During the war, Mr. Moore was with the New York office of the War Production Board as chief engineer. He later went with the Smaller War Plants Corp. as assistant regional deputy director.

—o—

Purdy Co., Chicago, dealer in railroad and contractors equipment, announces election of **John P. Purdy** as president, and **John I. Duffy** as executive vice president and secretary. Mr. Purdy succeeds **Sparrow E. Purdy,** who has been made chairman of the board.

—o—

**Dr. Charles W. Rippie** has joined Lukens Steel Co., Coatesville, Pa., as a member of its sales development staff. He previously had been head of the technical service of the Research & Development Division of Merck & Co., Rahway, N. J.

—o—

Rockwell Mfg. Co., Pittsburgh, has announced that **Louis X. Ely** has assumed the position of consultant to the Monessen Foundry Division, Monessen, Pa. He was formerly owner of Monessen Foundry & Machine Co. before it became a division of Rockwell Mfg. Co. in 1945, and at that time he remained as general manager of the new division. He is succeeded in that position by **C. H. Dougherty,** formerly assistant to Mr. Ely. Mr. Ely desires to devote more of his time to personal interests.

—o—

**J. H. Dowling** has been appointed general manager of Follansbee Metal Warehouses, a division of Follansbee Steel Corp., with warehouses in Pittsburgh, Rochester, N. Y., and Fairfield, Conn. Mr. Dowling has been with Wheeling Corrugating Co., a division of the Wheeling Steel Corp., for the past 20 years.

—o—

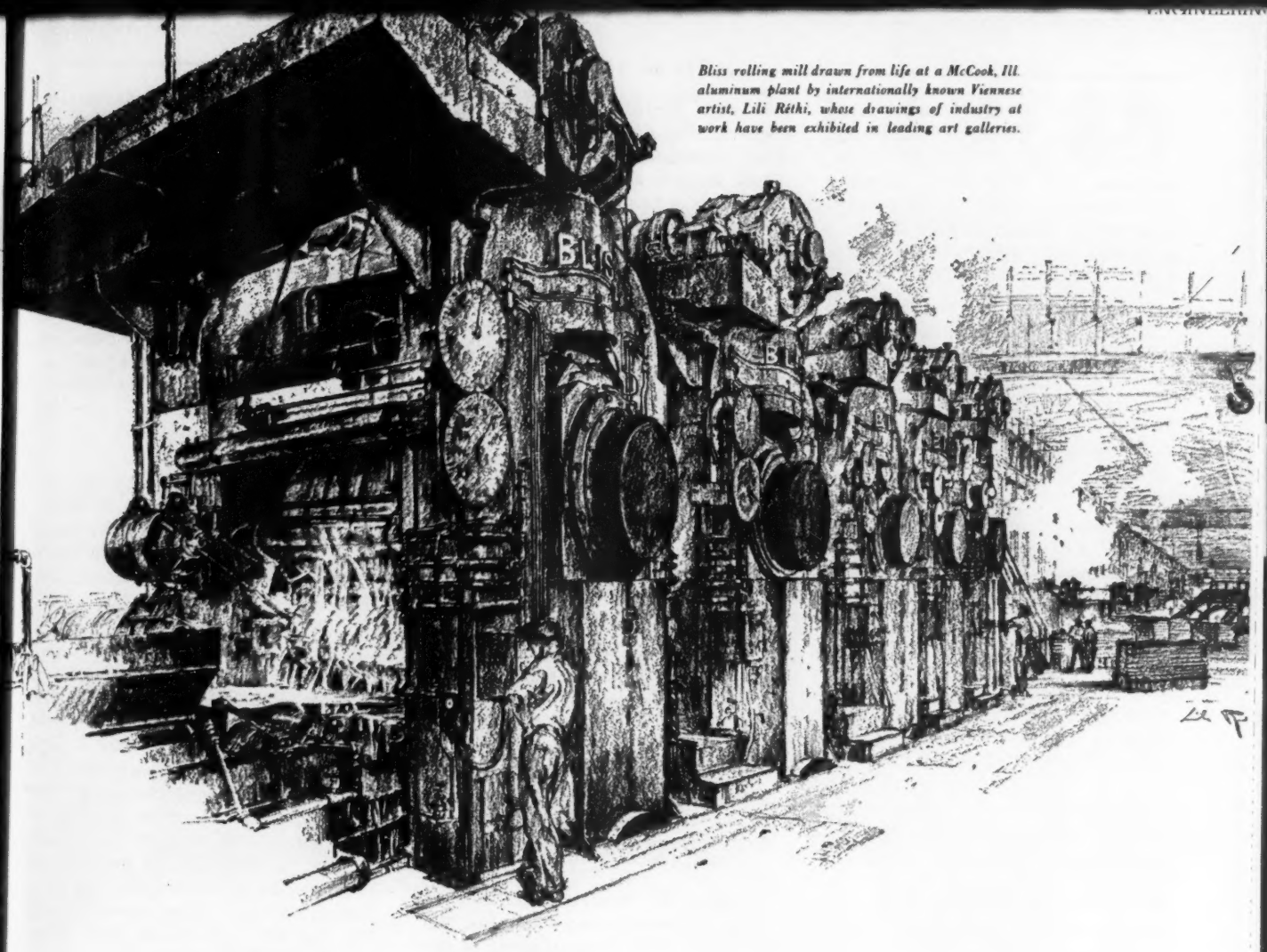
**Ray W. Christensen** has been appointed assistant advertising manager, Aluminum Division, Reynolds Metals Co., Louisville. He succeeds **J. C. Bjorkholm,** recently promoted to advertising manager of the company's Foil Division, with headquarters in Richmond, Va. Mr. Christensen has been with the Girdler Corp. and Tube Turns Inc., in Louisville, where for the last three years he has held the position of assistant advertising manager.

—o—

Putnam Tool Co., Detroit, has appointed **Douglas Straith** as field sales and service engineer. He has been associated with Republic Aircraft Division, Avco Mfg. Corp., Detroit, serving the past seven years in its Tool Engineering and Purchasing Divisions.

—o—

**John J. Risko** has been appointed assistant sales manager, Hendrick Mfg. Co., Carbondale, Pa., manufacturer of perforated metals, screens



*Bliss rolling mill drawn from life at a McCook, Ill. aluminum plant by internationally known Viennese artist, Lili Réthi, whose drawings of industry at work have been exhibited in leading art galleries.*

# The Third Dimension of Invention

The great creative strength of American industry is due, in no small measure, to its ability to place behind every inventor and his idea, men of equal genius, who provide *the means of production.* Without this means, this Third Dimension of Invention, our genius for creation would be unfulfilled.

The E. W. Bliss Company exemplifies this tradition of partnership between invention and means of production. For 90 years it has provided equipment for furthering mass-production of pressed metal articles...today, equipment from the four-high, five-stand tandem hot-strip aluminum rolling mill illustrated above, to presses of every type and size for fabricating all metals into finished products at low cost.

Think of the engineering and production knowledge vested in a company that has operated as a leader throughout an almost-century of the greatest industrial development the world has ever seen. You can put it to work for you. You will find answers to many problems which lie ahead.

E. W. BLISS COMPANY, DETROIT 2, MICHIGAN

*PRESSES*

**BLISS**

THE THIRD DIMENSION OF INVENTION

*ROLLING MILLS · CAN MACHINERY*

and open steel flooring. For six years Mr. Risko was manager of the sales order department of S.A.E. Steels Co., Cleveland, and later was a salesman for Columbia Tool Steel Co., Chicago Heights, Ill. **Harold A. Jope** has been appointed sales representative for the western half of Connecticut.

—o—

**Thomas Pope** has been elected president, Western Metalworking Association, Los Angeles. **William G. Wilson** was installed as vice president, **L. L. Rice** as secretary, and **Lee Miller, L. L. Rice** and **George Milligan** as directors.

—o—

Bridgeport Safety Emery Wheel Co. Inc., Bridgeport, Conn., announces the following management changes: **Henry F. Kalweit,** former controller, succeeds **John T. Kilbride** as president and member of the board. **William G. Schultz** has been elected vice president in charge of Sales & Machinery Division, and **Frank B. Laurich,** vice president in charge of the Wheel Division.

—o—

Appointment of **Irving Pirofsky** as market research manager has been announced by Daystrom Corp., subsidiary of ATF Inc., Elizabeth, N. J. **Robert F. Nelson** has been elected a director and vice president in charge of all engineering and manufacturing operations for American Type Founders Inc. Before joining ATF Inc., Mr. Nelson was vice president and assistant to the president, and a director of R. G. LeTourneau Inc., Peoria, Ill.

—o—

**John W. Craig** has been promoted to general works manager of Crosley Division, Avco Mfg. Corp., Cincinnati. Since 1945, he has been works manager of the Crosley Shelvador refrigerator plant in Richmond, Ind. His new duties include direction of all manufacturing and purchasing operations of Crosley and the Carrollton Furniture Co., Carrollton, Ky., a subsidiary engaged in the manufacture of radio and television cabinets.

—o—

**Howard J. Smith** has been named Chicago sales representative of Tel-Autograph Corp., New York. For the past two years he has represented Americana Corp.'s sales department in Chicago.

—o—

**Fred L. Warnke** has been appointed comptroller of United States Steel Supply Co., Chicago, a United States Steel Corp. subsidiary. Associated with the company the last four years, Mr. Warnke also has been elected a director and secretary of it. As comptroller he succeeds **C. B. Vernooy** who has been appointed comptroller of Geneva Steel Co., another U. S. Steel Corp. subsidiary. Comptroller of U. S. Steel Supply since February, 1942, Mr. Vernooy has been associated with U. S. Steel Corp. subsidiaries since 1919.

—o—

**Norman B. Krim** has been appointed manager of the Receiving Tube Division of Raytheon Mfg. Co., Newton, Mass., succeeding **Carl J. Hollatz,** vice president of Raytheon's subsidiary, Belmont Radio Corp., Chicago, who has been named general manager of Belmont, where he will devote all his time.

—o—

**William Lee** has been appointed district manager of the Houston, Tex., sales office of H. K. Porter Co. Inc., Pittsburgh.

—o—

**Gilbert F. Close,** director of personnel for the Granite City, Ill., plant of Commonwealth Steel Co., has been appointed director of public relations for General Steel Castings Corp., parent company. He will be attached to the staff of **C. P. Whitehead,** president, with offices in Granite City.

—o—

**Arthur S. Roberts** has been appointed secretary and counsel of SKF Industries Inc., Philadelphia, to succeed **Charles P. Collins,** resigned.

—o—

**Frederick C. Horner** has retired as director of field operations section of the distribution staff, General Motors Corp., Detroit. He will be succeeded by **Light B. Yost,** formerly assistant to Mr. Horner. Mr. Horner has been associated with General Motors for 25 years.

—o—

**Sam L. Brous,** formerly manager of sales development, B. F. Goodrich Chemical Co., Cleveland, has been named head of the company's new chemical sales department.

—o—

**Edwin L. Tindall** has been appointed district engineer for the Pittsburgh district for Carnegie-Illinois Steel Corp., subsidiary of United States Steel Corp.

—o—

**John S. Madden** has joined the G. A. Gary Co., Cincinnati, as sales engineer and assistant electrical engineer. He has been connected for 14 years with Westinghouse Electric Corp. as a sales engineer.

—o—

**Carl P. Simmons** has been appointed service engineer of the Philadelphia territory of the Nelson Sales Corp., Lorain, O. He was formerly service engineer for the Chicago territory.

—o—

Pennsylvania Transformer Co., Pittsburgh, announces appointment of **Rush F. Young** as manager of the Pittsburgh sales district. He joined the company in 1945 to take charge of the distribution transformer section of the sales department. The company also announces opening of a company sales office in New York, with **E. S. Banghart** as manager of the New York district. He had been associated with Allis-Chalmers Mfg. Co., for 20 years in its New York and Washington offices.

—o—

Ohio Crankshaft Co., Cleveland, announces appointment of **Dr. H. B. Osborn Jr.** to the post of technical director of the company's Tocco Division. Dr. Osborn will devote his time to exploring and developing new fields for induction heating equipment. He joined the company in 1940 as research and development engineer, and in 1946 was named sales manager of the Tocco Division.

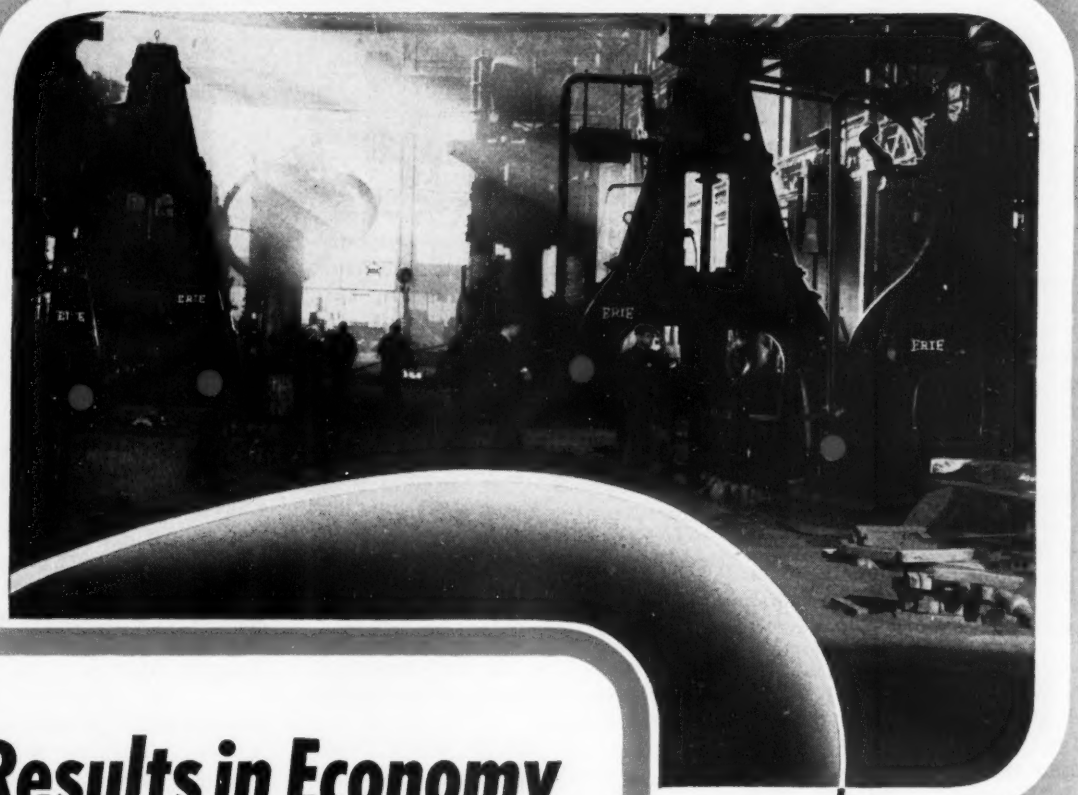
—o—

**George Stout,** sales promotion man-

SAM L. BROUS

DR. H. B. OSBORN JR.

# *Diversity* IN ERIE HAMMERS




## Results in Economy *in Quality* FORGINGS

Erie Steam Hammers left above, Erie Double Frame Forging Hammer right center, and Erie Single Frame Forging Hammer, Right. Erie Pneumatic Hammers, Board Drop Hammers and Trimming Presses complete the forge shop line. Erie Hydraulic Presses are built in a wide range of sizes and types. Bulletins on each are available now. Write for your copy.

ERIE

• ERIE FOUNDRY COMPANY • *Erie, Pa., U.S.A.*

ERIE BUILDS *Dependable* HAMMERS

ager, Perfect Circle Corp., Hagerstown, Ind., has resigned that position in order to devote full time to establishing his own merchandising and advertising service in New Castle, Ind.

—o—

**Arthur A. Clay,** for some years associated with Ohio Steel Foundry Co., Lima, O., as comptroller, has resigned to engage in his own business.

—o—

**Howard E. Sill,** vice president, Muncie Gear Works Inc., Muncie, Ind., has been elected secretary and treasurer, Stoker Manufacturers' Association, Chicago, to succeed **F. H. Herndon,** sales manager, Stoker Division, Link-Belt Co., Chicago, retired. **C. P. Meredith** vice president, Steel Products Engineering Co., Springfield, O., has been named a member of the association's board to fill the vacancy created by Mr. Herndon's resignation.

—o—

**Roger W. Batchelder,** formerly general purchasing agent, has been appointed assistant to the president of National Bearing Division, American Brake Shoe Co., New York. **William H. Old** has been appointed general purchasing agent for the company.

—o—

**O. B. Wilson** has been named industrial manager for the eastern sales region of Brown Instrument Division, Minneapolis-Honeywell Regulator Co., Minneapolis. He has been connected with the organization for the past 25 years, and has served as a sales engineer in various parts of the country, and industrial manager in Houston, Chicago and New York. He will continue to make his headquarters in New York, where he has been manager for the past two years.

—o—

**Nicholas E. Meyer** has been appointed manager of sales for Oil Well Supply Co.'s Wilson-Snyder Division. Mr. Meyer, whose headquarters will be at Braddock, Pa., succeeds **Howard W. Booth,** transferred to the Export Division of this U. S. Steel Corp. subsidiary.

—o—

**Henry W. Schmidt,** secretary of the Upson Co., Lockport, N. Y., for the past several years, has been elected secretary-treasurer. **James J. Upson,** who has been associated with the company in various capacities, following service in the Navy, has been appointed assistant to the president. **Charles G. Ostertag** has been named sales manager for the Central Division of the company, and will have headquarters in Atlanta. **George A. Engel** has been named Western Division sales manager, with headquarters in Kansas City, Mo. Mr. Engel formerly served in the Denver area, where he is now succeeded by **Kenneth R. Pugh.**

—o—

**Clyde E. Bayer,** general superintendent, Weirton Steel Co., has been promoted to the Great Lakes Steel Corp., Detroit, as assistant vice president in charge of operations of this division of National Steel Corp.

—o—

Link-Belt Co., Chicago, announces establishment of two new district sales offices. One is in Charlotte, N. C., at which **Thomas H. Appleton** has been appointed district sales manager. Mr. Appleton formerly was district sales engineer at Baltimore. The other is at Wilmington, Del., with **William H. Kinhead** appointed district sales manager. Mr. Kinhead has been associated with the company's Philadelphia plant in various capacities since 1920, when he entered the employ of the Positive Drive Division.

—o—

**L. P. Holliday III** has been appointed manager of sales development in the Chlorine Products Division of the electrochemicals department of E. I. du Pont de Nemours & Co. Inc. Wilmington, Del. He has been serving as a technical development investigator in that department.

—o—

**Donald H. Workman** has been named promotion manager of the Gray Iron Founders' Society Inc., Cleveland.

—o—

**R. Heath Larry** has been appointed general attorney of U. S. Steel Corp. of Delaware. **Frank L. Wiegand Jr.** has been elected secretary and general attorney of National Tube Co., subsidiary company, succeeding Mr. Larry in that position which he has held since 1944. Mr. Wiegand has been with Oil Well Supply Co., another U. S. Steel Corp. subsidiary, where he has been secretary and general attorney at Dallas, Tex.

—o—

**A. W. Reynolds** has been appointed assistant to the executive sales manager for Southern Alkali Corp. and the Columbia Chemical Division, Pittsburgh Plate Glass Co., Pittsburgh.

—o—

**Stuart W. Goodenough** has been appointed assistant manager of the manufacturers products sales department, American Steel & Wire Co., Cleveland, subsidiary of U. S. Steel Corp. He succeeds the late **C. J. Quill.** Mr. Goodenough, associated with the company since 1926, has recently been on the staff of the general manager of sales in Cleveland.

R. NEVIN WATT

*Elected assistant vice president-domestic sales, Baldwin Locomotive Works, Philadelphia. Noted in STEEL, Feb. 2 issue, p. 90*

—o—

**Ann E. Hamilton** has been appointed sales promotion manager of Ajax Electric Co., Philadelphia.

—o—

**John J. Connors** has been appointed purchasing agent for A. Schrader's Son Division of Scovill Mfg. Co. Inc., Brooklyn, N. Y., succeeding the late **Clarence Wilcox.**

—o—

**Fred P. Biggs** has been appointed first vice president of Brake Shoe & Castings Division, American Brake Shoe Co., New York. He has been with the company since 1916. In addition to his new duties, Mr. Biggs will continue as vice president in charge of sales of Brake Shoe & Castings and Southern Wheel Divisions.

—o—

**Robert J. Wilson,** general manager of Western Metal Specialty Co., an affiliate of Industrial Mills Inc., Milwaukee, has been appointed a vice president. Prior to his association with Western Metal, Mr. Wilson had been president and general manager of Kempsmith Mfg. Co., Milwaukee, and a vice president and general manager of Western Steel Products Co., Duluth.

—o—

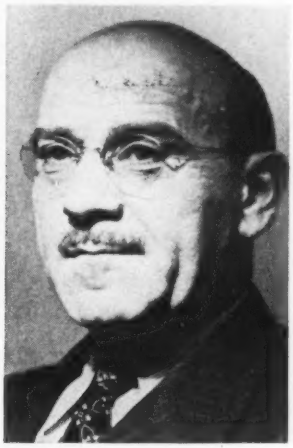
**P. G. Little** has been named acting general works manager of the Nash Motors Division in Kenosha, Wis., of Nash-Kelvinator Corp. He succeeds the late **Harold E. Long. Lawrence Finkler,** factory superintendent, temporarily has assumed the duties of factory manager of **H. R. Costly.**

—o—

**Carl A. Ilgenfritz,** vice president-purchases, United States Steel Corp. of Delaware, has been appointed by

LEO A. BEHRENDT
*Vice president-marketing for three industrial divisions, Joseph Dixon Crucible Co., Jersey City, N. J. STEEL, Mar. 8, p. 74*

ALFRED W. SCHULTZ
*Who has been appointed chief engineer of the Lombard Corp., Youngstown. Noted in STEEL, Mar. 8 issue, p. 78*



F. C. RITNER
*Has been appointed vice president in charge of personnel, Carboloy Co. Inc., Detroit. Noted in STEEL, Mar. 8 issue, p. 80*

former President Herbert Hoover to a special committee of the Commission on Organization of the Executive Branch of the Government.

—o—

**Chester Bland,** president, Ohio Electric Mfg. Co., Cleveland, has been elected to the board of directors, Superdraulic Corp., Dearborn, Mich., maker of hydraulic pumps and power transmissions. Mr. Bland also is president of H. P. Townsend Mfg. Co., Hartford, Conn.

—o—

**W. Hunter Russell,** formerly district manager of the Baldwin Locomotive Works in St. Louis, has been named vice president of the Spring Packing Corp. in Chicago, and will be in charge of the company's recently established Metallic Packing Division.

—o—

**Charles F. Keyser Jr.** has been appointed manager of distributor sales for Shakeproof Inc., Chicago. He has been associated with the firm in various sales and advertising capacities since 1937.

—o—

**Clinton E. Stryker** has been elected president of Maysteel Products Inc., Milwaukee. He formerly was president of Adel Precision Products Corp. and Aerco Corp., Burbank, Calif., prior to which he was vice president and assistant to the president of Nordberg Mfg. Co., Milwaukee.

—o—

**James L. Byrom** has been appointed manager of the Chandler-Evans Division of Niles-Bement-Pond Co., West Hartford, Conn., succeeding **Leslie McArthur,** who recently was appointed a vice president. Mr. Byrom joined the organization as a production and engineering executive in July, 1947.

—o—

**I. J. Barber,** director of engineering for Fostoria Pressed Steel Corp., Fostoria, O., has been promoted to a vice president.

—o—

**Fred Bohle,** chief engineer for Illinois Tool Works, Chicago, is attending the 13th session of the Advanced Management Program being held at Harvard University from Feb. 25 through May 22.

## *OBITUARIES . . .*

**Leslie A. Wiggins,** 55, vice president in charge of the Rome Division of Revere Copper & Brass Inc., Rome, N. Y., died Mar. 5. He joined the Rome Brass & Copper Co. in 1919. When this company became a division of Revere, Mr. Wiggins was made sales manager of the company. In 1936 he was elected a vice president.

—o—

**Joseph H. Slater,** 54, assistant manager of the Cleveland district, Republic Steel Corp., and chairman of the company's blast furnace and coke committee, died suddenly at his office, Mar. 8. He had been associated with Republic Steel Corp. for 18 years.

—o—

**Kenneth Ferguson,** 60, purchasing consultant of H. K. Ferguson Co., Cleveland, died Mar. 1 following a heart attack. He had been associated with the company of which his brother, the late H. K. Ferguson, was president, since 1920, and was a vice president for a number of years.

—o—

**William B. Brown,** 72, chairman of the board, T. E. Conklin Brass & Copper Co., N. Y., died recently.

—o—

**L. H. Treadway Jr.,** 43, safety director for the last several years for the Cleveland works of Aluminum Co. of America, died in Litchfield Park, Ariz., of a heart attack, while vacationing there.

—o—

**Frank R. Fretz,** for the last 15 years an industrial engineer with Trundle Engineering Co., Cleveland, died of a cerebral hemorrhage Mar. 1.

—o—

**A. W. Coppin,** 52, for 12 years secretary and counsel of Harnischfeger Corp., Milwaukee, died recently in Chicago after a long illness. At the time of his death Mr. Coppin was secretary of Foote Bros. Gear & Machine Corp., Chicago.

—o—

**Wells K. Gregg,** 57, president, Screw Machine Products Co., Bay City, Mich., died Mar. 4 of a heart attack.

—o—

**John P. Elton,** 82, retired vice president and treasurer of American Brass Co., Waterbury, Conn., died Mar. 7 in Pinehurst, N. C., where he was vacationing. At the time of his death, Mr. Elton was a director of the Scovill Mfg. Co. and several other Connecticut industrial corporations. He began his career with the Waterbury Brass Co., which later merged with other brass concerns to form the American Brass Co.

—o—

**Kenneth N. Cook,** assistant sales manager, Rollway Bearing Co. Inc., Syracuse, N. Y., died Mar. 5. He had been with the company since 1927.

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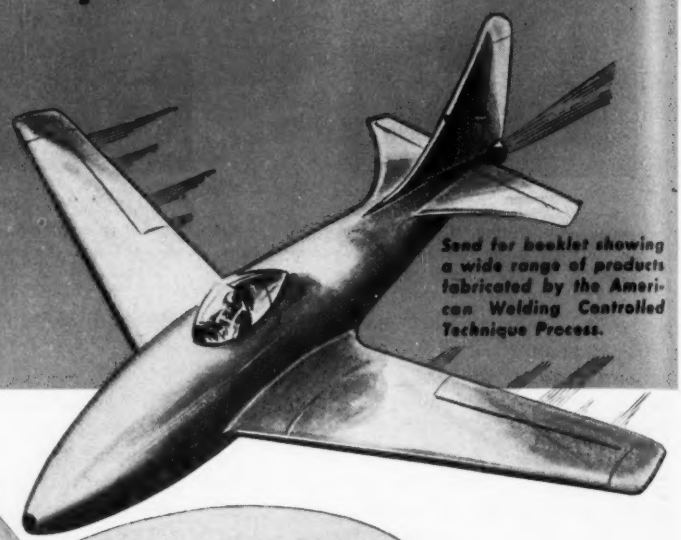

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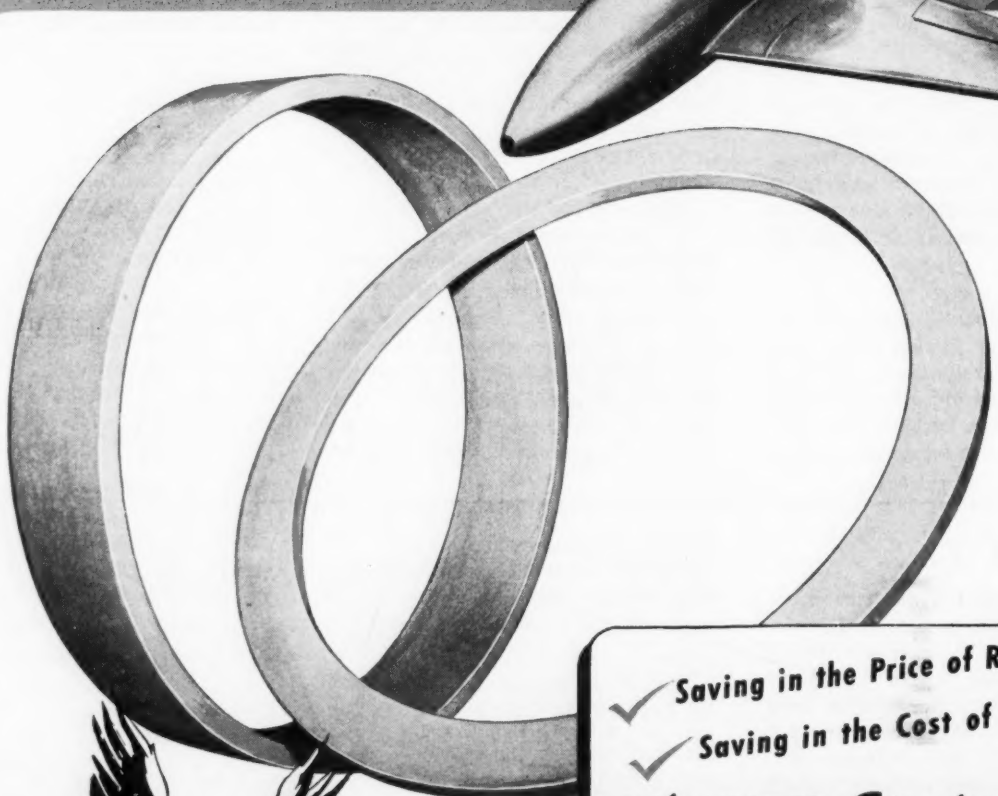

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# Engineering News
## . . . AT A GLANCE

**DECARBURIZATION, THE "CULPRIT"**—One of the best alternatives in overcoming decarburization, according to Ray McBrian, engineer of standards and research, Denver and Rio Grande Western Railroad, appears to lie in strengthening the decarburized skin by use of ferrite-strengthening alloying elements in the steel—at least so far as railroad steels are concerned. He pointed out that decarburization was the culprit responsible for many failures. Its influence is evident in rails and joint bars, wrought steel wheels and tires and in plate materials such as boilers and firebox steels.

**HIGH PURITY GAS REQUIRED**—Many of the inconsistencies in inert-gas welding are due mainly to the impurity of the inert gas being used, it was stressed recently by Arthur N. Kugler, before the Terre Haute, Ind., chapter of ASM. Purity required, he emphasized, is much higher than that used for normal medicinal and other purposes. Process can be used to weld all metals, many of them without flux, but its best performance is in connection with aluminum and stainless steel.

**SOLVES DESIGN ENGINEER'S HEADACHES**—Problem of product engineers would be greatly simplified if suggestion of W. A. Schlegel were to be followed. The Carpenter Steel metallurgist believes two steel compositions can be used for approximately 95 per cent of all applications requiring alloy steels. One composition would consist of 0.50 per cent carbon, 0.50 per cent manganese, 0.20 per cent silicon, 1.00 per cent chromium and 1.75 per cent nickel, and the other 0.10 per cent carbon, 0.30 per cent manganese, 0.20 per cent silicon, 1.50 per cent chromium and 3.75 per cent nickel. Former is an oil hardening type while the latter can be case carburized. According to the metallurgist, broad range in physical properties is possible and quite practical with both steels.

**DEZINCS UNDER VACUUM**—Subsitute process of dezincing under a high vacuum was developed recently in an improved method of extracting zinc from molten lead now used by Herculaneum plant of St. Joseph Lead Co. Process, which not only is practical but more economical than the previous method, can be used to recover well over 90 per cent of the zinc content left in the lead after desilverization. Previously, following desilverization there remained in the lead about 0.5 to 0.6 per cent zinc which was removed by heating the lead in a reverberatory furnace. This was disadvantageous in that a considerable amount of lead as well as zinc was oxidized, necessitating continuous collecting and remelting of fumes and dross.

**BENDING WITHOUT CRACKING**—To avoid cracking, only simple forming operations are in order when handling magnesium alloys at room temperature. The metal work hardens rapidly at this temperature, but its ability to deform without cracking is increased greatly by working at temperatures between 450 and 700° F. Higher temperatures are dangerous since magnesium may be "burned" at the upper end of the "black heat" range. According to Tempil Corp., New York, plates, sheets and tubes may be bent at room temperature if radius of bend is not too small. As a general rule, however, ductility increases markedly at 450° F. Also, heating may be done economically with a blowtorch, since these alloys cool rapidly, and the use of forms preheated to 300° F or so is advisable in bending.

**CRACKS BOTTLENECK**—Method of press forming developed in the plant of Canton Drop Forging & Mfg. Co. for producing 575-pound three and four-way aircraft propeller hubs reduces a number of operations to two, and releases badly needed hammers for other work. According to the company overall savings incurred amount to 20 days. Method includes following up forging with an isothermal treatment of each part. This reduces time required to bring forgings to room temperature with necessary hardness tolerance—from 19 to 2 days. Same treatment also eliminates flaking. (p. 90)

**IN-THE-MACHINE TEMPERING**—In discussing metallurgical aspects of carbon steel spot welding, J. Heuschkel of Westinghouse Research Laboratories, points out that the use of in-the-machine tempering or other special techniques appears to be even more desirable for cold-rolled steel above the low carbon range than for hot rolled or preannealed stock. "As made" welds in steels of both very low carbon and high carbon compositions are less strong in tension shear than those made in materials of optimum composition. (p. 93)

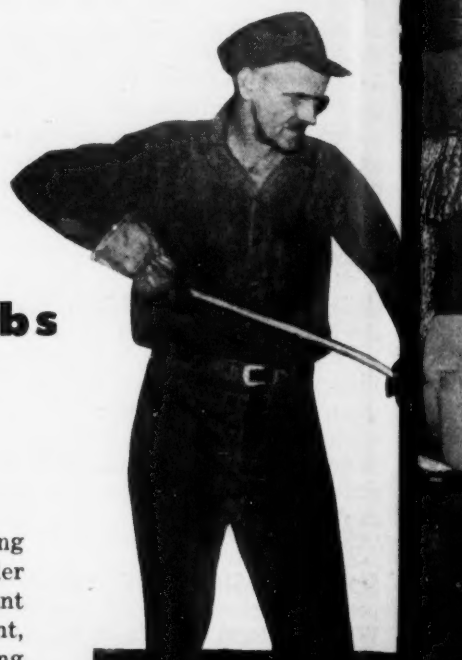
**MAGNESIUM AUTO WHEELS**—In experimenting with magnesium wheels for its cars, Kaiser-Frazer discovered that weight of each wheel (8 pounds) creates a saving in unsprung weight of 10½ pounds per wheel of 40 pounds for the car—a definite advantage in operation, exact extent of which the company is now in process of developing by experience runs on test cars. Any further increase in fabrication labor costs, increases in cost of steel or reduction in cost of magnesium, it is pointed out, also will make these wheels economically practicable, even without considering wear and tear on tires and improved operation. (p. 102)

**CRANE-HANDLED STANDS**—Roll changing is done on spare stands in the new precision mill recently placed in operation at the works of Darlington & Simpson Rolling Mills of Oldbury, Birmingham, England. The rolls are mounted and adjusted on the spare stands, maintained for the purpose, then lifted by crane and carried into position. The company rolls light special sections for metal windows, also specializing in light sections for the automotive and other industries. (p. 112)

*Specially-designed multiple-acting hydraulic equipment enables manufacturer to realize great savings in forging, heat treating and machining time on SAE 4340 steel parts*

# Hot Pressing

## 575-pound Propeller Hubs



By FRANK WELSHNER
*Chief Metallurgist*
and
A. A. FLOUT
*Design Engineer*

Canton Drop Forging & Mfg. Co.
Canton, O.

DRASTIC savings in forging, heat treating and machining time are being realized in the production of 575-pound three and four-way aircraft propeller hubs by the use of some unusual forging equipment at the Canton, O. plant of Canton Drop Forging & Mfg. Co. Designed by C. A. Brauchler, president, two special 6000-ton multiple acting circular-shaped hydraulic presses are being utilized to turn out finished forgings in a fraction of the time formerly required.

Original purpose of the presses was for the wartime production of aluminum cylinder head forgings, which had been dropped forged in a minimum of nine hammer operations. By developing this method of press forming, the number of operations was cut to two and badly needed hammers released for other work.

As can be seen in the accompanying photographs, each press is composed of a vertical or upright hydraulic cylinder combined with three or four horizontal cylinders which operate a combination of dies and plungers, designed to the forging in process. The vertical rams exert 2000 tons pressure with a maximum stroke of 24 inches; combined casting weight of the vertical cylinders is approximately 32 tons each. The horizontal cylinders exert approximately 1000 tons with a maximum stroke of 10 inches. These cylinders weigh approximately 11 tons each. Fig. 4 indicates weights of various press components.

In the assemblies, no frames or columns are included. The interlocked hydraulic cylinders themselves form the body of the press, so keyed into a top ring and base that the cylinders are capable of withstanding the forces exerted. Furthermore, the horizontal cylinders are movable and can be located at various angular positions to each other. Changes from one setup to another are made in a matter of 24 hours or less.

The hydraulic cylinders are intermittently operated by 5000-pound oil pressure, powered and controlled by a combination of two $3\frac{1}{8}$ x 18 horizontal duplex double acting Worthington hydraulic pumps of 350 horsepower each. Operating valves and control accumulators are of R. D. Wood manufacture. The 5000-pound valves for the hydraulic system are controlled by 500-pound capacity Servo system which can be seen in the foreground of Fig. 5.

Larger of the two presses is based on a 17-inch thick rolled steel plate by 125-inches square, weighing 75,740 pounds and located on a 10-foot deep concrete foundation. Completed weight of the press is 257,500 pounds. Some 291 cubic yards of concrete were used for the press and pump foundation. The press itself is 138 inches from base ring to the top of the semicircular steel dome. Upper and lower rings are 125 inches in diameter.

Propeller hub forgings presently being processed on this equipment are made from electric furnace aircraft quality nickel-chromium-molybdenum (SAE-4340) steel supplied to the customer's specification for hardenability, grain

*Fig. 1—Rough forging is positioned in press. Note that no frames or columns are used in press construction. Interlocked hydraulic cylinders form body of press and are keyed into top and bottom rings so that they can be located at various angular positions to each other, depending upon the job*

*Fig. 2—Entire forging operation, from time rough blanks are removed from heating furnace, consumes approximately 1½-minutes. This finished hub has just been pushed out of lower die by a lifter knockout, designed to prevent forgings from sticking*

*Fig. 3—Removing 575-pound finished forging from press*

size and physical properties of heat treated material. Billets for the forgings are cut into suitable multiple lengths by cold sawing. Samples from each billet are deep etched and tested for soundness and freedom from defects that will result in unsatisfactory hub forgings or excessive rejections for magnaflux indications of the finished forgings.

Previous practice was to make propeller hubs from solid drop forgings in which neither the barrel nor the propeller shaft axis was pierced. With the present equipment, barrel of the hub is extruded to a depth of approximately 5½-inches, and in such a manner that only normal machining allowances are required on the inside and outside diameter of the propeller hub barrel. The new press also permits the forgings to be partially pierced along the propeller shaft axis. Table I shows weight of a similar three way hub produced in the conventional drop forge method and similar hub produced with the new pierced barrel press. Comparable weight savings are realized on the four-way forgings.

Sequence of operations for forging a three-way propeller hub in the new press is briefly as follows: An 11-inch round cornered square billet weighing approximately 780 pounds is heated in an oil-fired furnace to 2150° F and then forged in a set of blocking dies on a 35,000-pound Chambersburg hammer. Without allowing the rough forging to cool, it is reheated to 2200° F in an oil-fired furnace and then placed in the new hydraulic press. The rough forging is positioned in the lower die and the vertical die and vertical plunger pressed down on to the forging blank. This forms the extension end of the hub, partially pierces the propeller shaft axis and securely holds the blank in the press die for the balance of the operation.

With the vertical dies acting as a positioner, the horizontal water-cooled rams (three or four, depending upon the type of hub being forged) move in from the side and form the barrels of the hub. As previously mentioned, the rams pierce the barrel to a depth of approximately 5½-inches. Knock-out pins in the lower platen prevent the forging from sticking in the die. The entire forging operation consumes approximately 90 seconds from the time the hot forging is removed from the heating furnace until the operation is completed. No flash is present so no trimming of the forging is needed.

In order to prevent flaking difficulties which are frequently present in larger forgings of high alloy steel it has been a common (*Please turn to Page* 121)

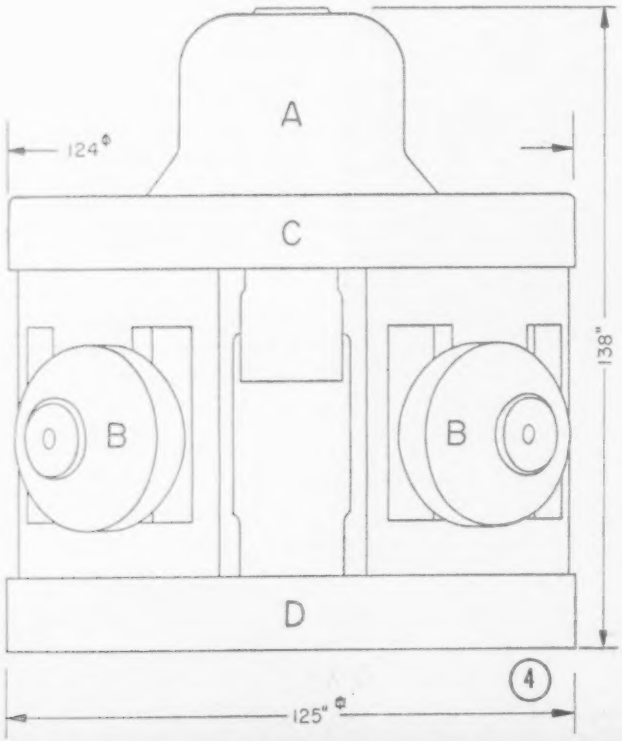



*Fig. 4—Approximate weights of principal componets of press are (A) 64,000 pounds (B) 22,000 pounds, (C) 48,440 pounds, (D) 75,740 pounds. A and B are castings, B and C rolled plate*

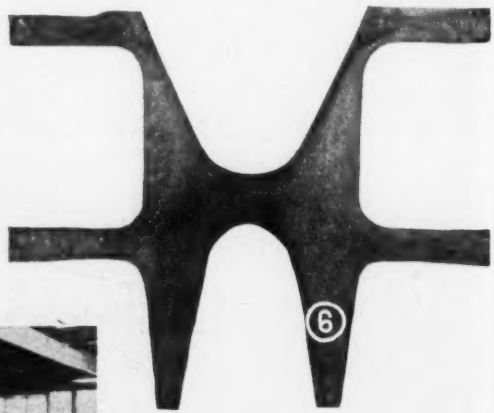



*Fig. 5—Hydraulic cylinders are intermittently operated by 5000-pound oil pressure, powered and controlled by a combination of two 350 horsepower Worthington hydraulic pumps. Valves for the hydraulic system are controlled by the 500-pound capacity Servo system shown in the foreground*

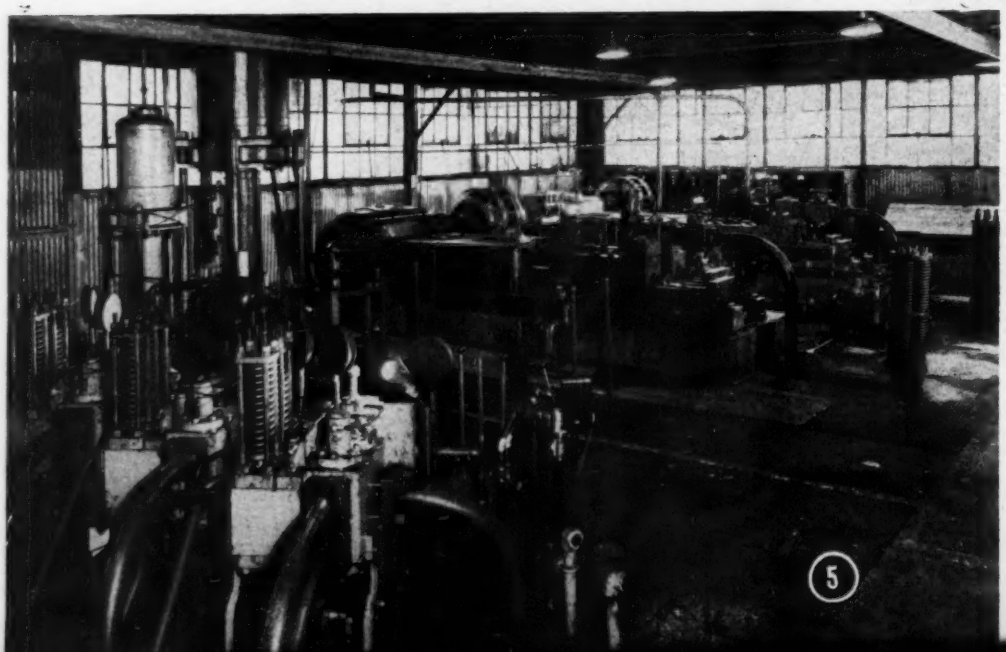



*Fig. 6—Extrusion of barrels results in marked improvement in grain flow pattern*

# METALLURGICAL ASPECTS OF

# Carbon Steel Spot Welding

*In this first section of two-part article, the author summarizes results of studies into the properties obtained from both heat treated and "as made" spot welds in annealed, hot rolled and cold rolled carbon steels up to ½-inch thick and containing 1.09 per cent carbon*

By J. HEUSCHKEL
Westinghouse Research Laboratories
East Pittsburgh, Pa.

PHYSICAL tests were made upon heat treated and untreated spot welded specimens to ascertain the influence of carbon content, thickness and initial properties upon the tension-shear and direct-tension strengths of spot welds in carbon steels up to ½-inch thick and up to 1.09 per cent carbon content. Hardness, metallographic and strength studies were made on the welds in an effort to relate such measurable results to known metallographic phenomena. This combination of studies provided a satisfactory background for explaining the results obtained from standard physical tests.

The following conclusions were reached, based upon the statically-loaded normal temperature performance of single-weld specimens in carbon steel, made with a single-impulse single-force technique involving an adjustment of the electrode-force-current-time spot welding variables upward with increases in material thicknesses.

For all compositions less than 0.065-inch in thickness the critical quench rates were exceeded and the weld nuggets and the immediately surrounding metal was in the condition of maximum hardness. Critical quench rate for the high carbon steels was exceeded up to 0.12-inch thick.

Spot weld nugget and immediately surrounding metal are cooled more slowly in the thicker plates, which results, for a given composition and temper, in lesser hardness and higher ductility. Spot welding conditions used for welding thin sheets result in quench rates higher than those encountered in any other commonly used welding process. High magnification microcracking can be obtained with carbon contents as low as 0.12 per cent for very thin sheets.

Maximum hardness was commonly obtained at the weld interface edge as a result of the solid metal quench. Ductility of "as made" spot welds varied inversely as the maximum hardness of the weld edge but for a given hardness the values were different for different material thicknesses and tempers and therefore hardness alone cannot be used as a criterion of spot weld quality.

Tension-shear type of test of suitable specimen width may be used for

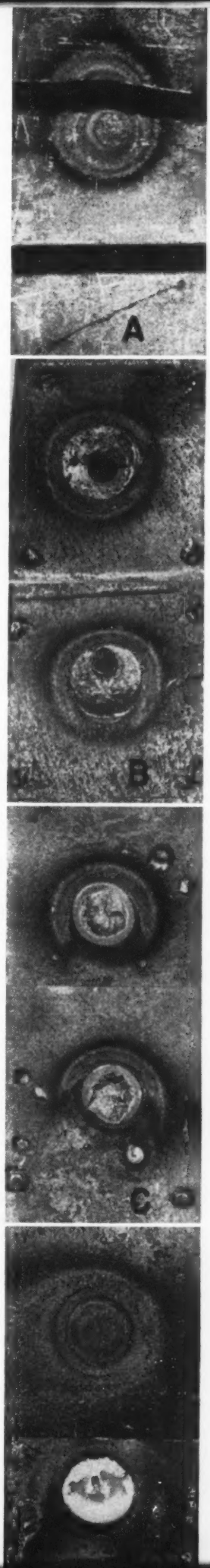



*Fig. 1—Examples of weld fracture types for ½-inch stock. A—Weld edge, B—button, C—cone, D—interface*

detecting brittle welds in a given grade of material although it is not as sensitive to variations in brittleness as the direct-tension type of test. Tension-shear strength alone is not a complete criterion of weld quality. Conventional direct-tension type of test is a bending-tension superimposed upon tension test with the maximum point of stress concentration located at the interface, and generally the hardest, edge of the weld nugget.

For resisting severe stress concentration conditions it is important that the metal at the edge of the weld have adequate strength and ductility to withstand the imposed deformation. High loads cannot be resisted without considerable accompanying deflection for both the conventional tension-shear and direct-tension type of single weld row specimens.

Spot welding schedule used provided welds within the recommended range of analyses which have an average tension-shear strength consistency or standard deviation of less than 6 per cent from the average. Higher forces or lower currents, or both, must be used for the higher carbon steels. Use of in-the-machine tempering or other special techniques appears to be even more desirable for cold rolled steel above the low carbon range than for hot rolled or preannealed stock.

For each thickness of hot rolled or preannealed material there is an optimum composition from which welds of maximum tension-shear strength will be obtained without treatment of any kind. "As made" welds in steels of both very low carbon and the high carbon compositions are less strong in tension-shear than are those made in materials of the optimum composition. For balanced maximum tension-shear and direct tension strengths the maximum carbon content for hot rolled, peannealed or normalized stock should be held to not more than 0.10 per cent plus 0.3 times the material thickness.

Maximum strengths and deflection are obtained with a minimum of carbon content for direct tension loading. Carbon contents must be more rigidly restricted downward for cold rolled material as compared to hot rolled materials, for those applications wherein serious stress concentrations may occur and special welding techniques are not involved.

Use of a 1150° F anneal results in the production of welds of both maximum strength and ductility for the higher carbon materials and a minimum of strength with maximum ductility for the low carbon steels. A 1420° F anneal results in the production of ductile welds of strengths somewhat less than that obtained for the 1150° F treatment. Use of the ratio of the tension-shear strength of the 1150° F annealed to the "as welded" values for hot rolled or preannealed steels provides a simple specific means for segregating ductile from brittle welds.

Spot welds in hot rolled or preannealed steel having a direct-tension to tension-shear strength ratio of less than 40 per cent will have their tension shear strengths increased by an 1150° F anneal. Use of an annnealing treatment very greatly increases the strengths of high carbon steel spot welds subjected to severe stress concentrations.

For a given composition, welds in cold rolled steel are stronger in tension-shear and less strong in direct-tension and consequently their ductility ratios are much less than for the hot rolled or preannealed steels.

Steel spot welds, Figs. 4 and 5, consist of a central nugget of resolidified metal, which is surrounded in all three dimensions by an enclosing shell of recrystallized metal. This surrounding shell has been heated above the critical temperature but not up to the melting temperature. At the circumference or periphery of the weld this shell acts as a restraining envelope for the inner nugget of molten metal and upon cooling is a solid phase or pressure weld, commonly referred to as a "corona". It is in turn ordinarily completely encased, except for the air gap between the faying surfaces, within the confines of subcritically heated and therefore metallurgically unaffected base metal.

For hot rolled, annealed or normalized steel the metal must be heated above the critical temperature before changes in metallographic structure occur. The rate of quench, up to a certain critical rate which

*Fig. 4—Spotweld thermal circuits*

*Fig. 5—Weld mid-section in ⅛-inch stock*

*Fig. 6—Vickers hardness traverse across spotweld in 0.03-inch 0.82 per cent carbon steel "as welded"*

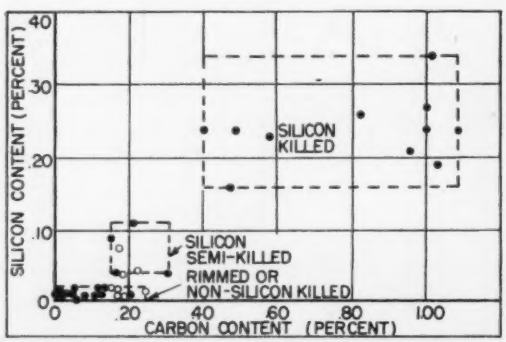



*Fig. 2 — Carbon-manganese and carbon-silicon relations for materials investigated*

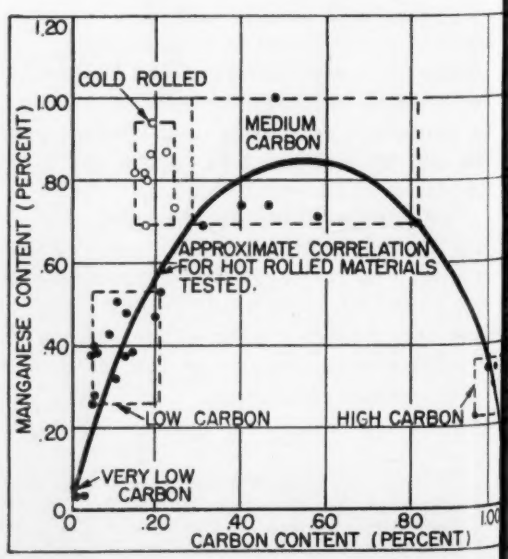



*Fig. 3 — Material thickness composition and maximum hardness relations*

varies with composition, is a most important factor in determining the final charcteristics and properties for each composition. Time at temperature and grain size exert their influence but are secondary in importance.

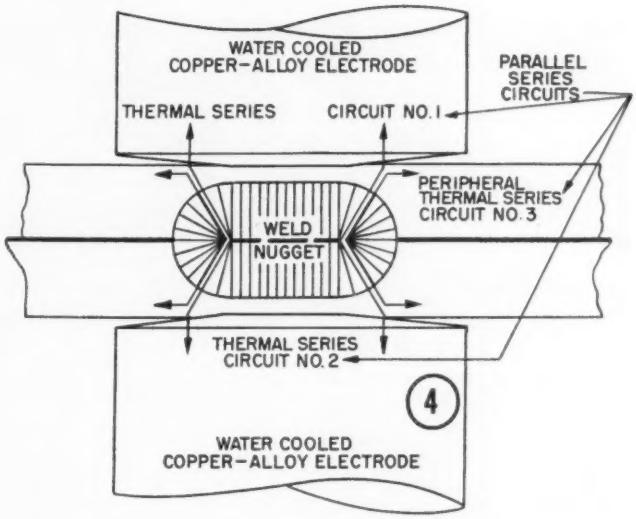
Both cold rolled and quenched metallographic structures are materially affected by subcritical temperature treatments. Both materials can be softened, their strengths reduced and their ductilities increased by heating to subcritical temperatures, such as 1100° F. This treatment may materially influence the physical properties while having little or no affect upon the microstructure.

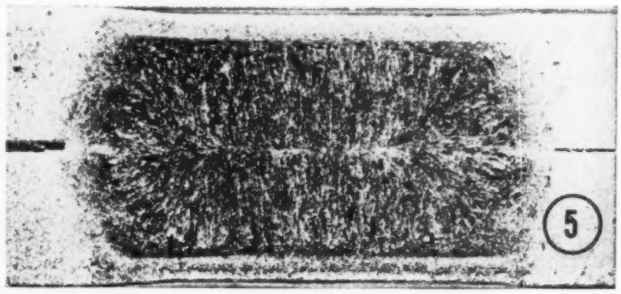
For all initial conditions and compositions, when the material is heated above the upper critical temperature and then quenched in excess of the critical rate, the steel will be in its full hard condition and the magnitude of the hardness will be determined by the amount of carbon present in that particular portion of the part.

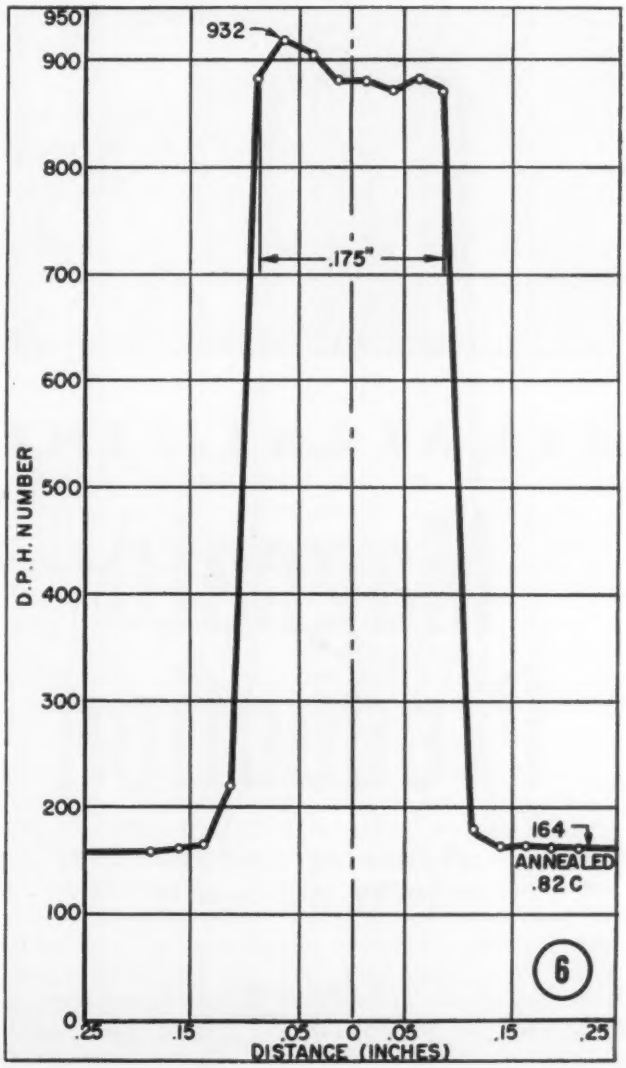
All of these phenomena are encountered in the spot welding of carbon steels. Accordingly it is not surprising that a rapidly quenched cast steel spot weld made with a fixed welding schedule may have widely different properties, depending upon the thickness, composition and temper of the steel. Primary objectives of the present investigation were therefore to: (1) Provide data for use in the selection of steels for spot welded applications wherein no subsequent heat treatments of any kind are employed, (2) provide data for determining when to begin the use of special controls and heat-treating techniques, (3) serve as a basis for conducting weld heat treating studies and (4) correlate the properties of the weld edge zones to known metallographic phenomena.

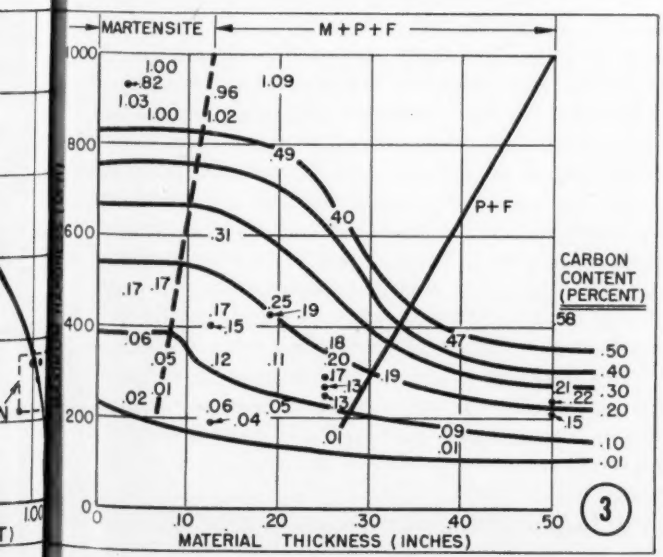
It was found that sheets thinner than 0.065-inch were subjected to quench rates in excess of those which provide maximum possible hardness for the amount of carbon contained in the steel. Imposed stress concentrations commonly occur at the same point as that of maximum hardness, namely, at the periphery of the ingot. The sensitivity of the weld to these conditions and to (*Please turn to Page* 124)

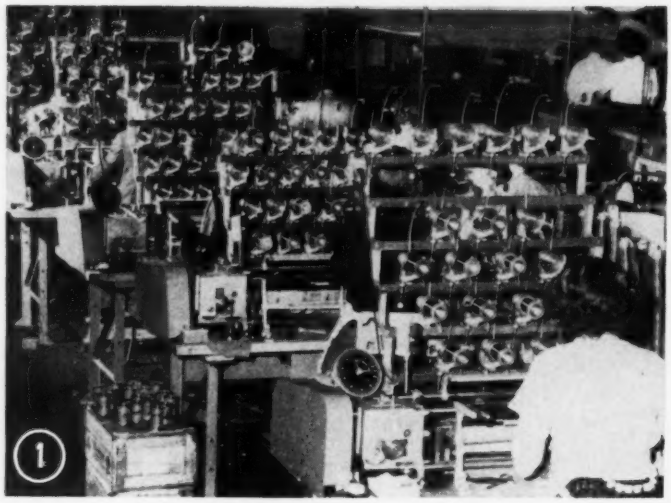






# STRAIGHT-LINE Magneto Production

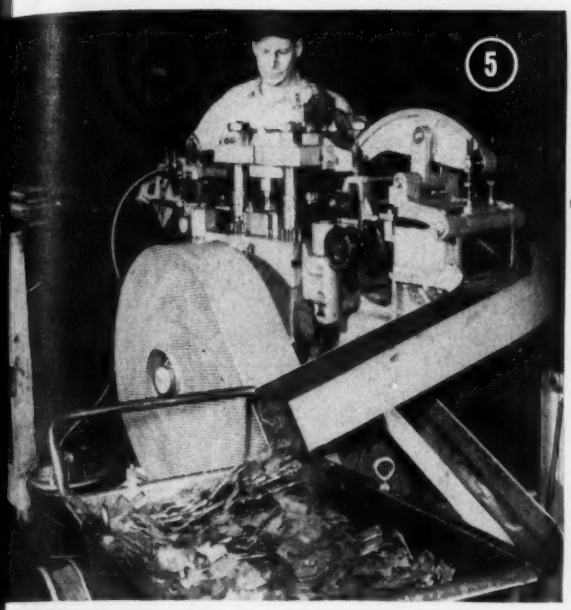
## . . . affords increased product quantity and quality

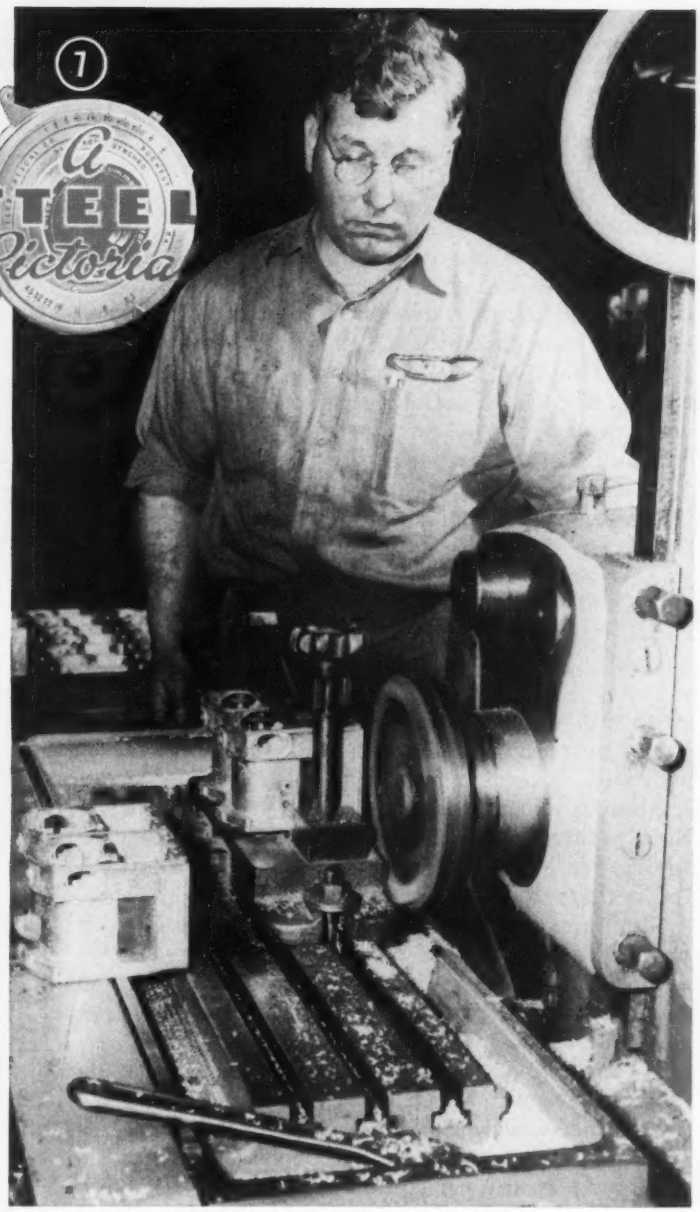
By DAN REEBEL
*Associate Editor, STEEL*

*Photography by Author*

PAVING the way for straight-line production with attendant increases in both quantity and quality of output is the new magneto division layout recently set up in the Maple Heights plant of Jack & Heintz Precision Industries Inc., Cleveland. Produced on this line is the Eisemann magneto, a leader in the field since 1904 and now manufactured by Jack & Heintz following their merger with Eisemann Corp. on April 18, 1946. The company manufactures two basic types of magnetos, the conventional and the fly-wheel. Four conventional designs are produced to meet various needs, one being used in light aircraft engines, another in many types of auxiliary power plants, and the other two in tractors. The fly-wheel magneto, manufactured in numerous designs and in 5, 6 and 7-inch sizes, is employed in a wide variety of light one and two cylinder engines such as those which power lawnmowers, gasoline engine washing machines, power saws, outboard motors, motor bikes, motor scooters, cultivators and many other farm implements.

As a matter of interest, Precision Products Corp.






was incorporated under the laws of the state of Delaware February 1946. At that time this corporation was backed by a group of New York financiers and industrialists under the leadership of Byron C. Foy, former president of DeSoto Motor Corp. and vice president of Chrysler Corp. The wartime Jack & Heintz Inc., on March 6, 1946, was merged into Precision Products Corp., the name of which was then changed to Jack & Heintz Precision Industries, Inc. Six weeks later on April 18, 1946, the Eisemann Corp., Brooklyn, N. Y., was merged into the new combine. The organization now produces and sells fractional horsepower electric motors, ball bearings, magnetos, refrigeration condensing units, electric aircraft engine starters, generators, inverters, aircraft actuating and retraction motors and other aviation accessories. The new organization is prepared to carry out in peacetime the production record established during the war by the old Jack & Heintz Inc. During 1947 two basic methods were used to greatly increase production. They were the consolidation of all allied processes in one central plant area and the introduction of key production personnel skilled in mass production techniques.

Magneto division production begins in the rear of the plant and moves progressively to the front from which point packing and shipping facilities are made available. Layout utilizes straight-line production procedures wherever possible with all subassemblies being made as close as possible to the place in which they are to be used on the assembly line. Winding one core at a time, primary coil-winders use wire 0.028-inches in diameter applying 150 turns per coil while the secondary coil-winders, producing 15 coils at one time, apply 10,500 turns per coil of 0.0031-inch wire. In final assembly, the primary coil fits inside the secondary coil, thus serving as the core. Secondary coil-winders are shown in Fig. 1 with primary coil-winders visible immediately to the right of the roller conveyor. After finishing and assembling, as shown in Fig. 2, coils are ready for impregnation with a dark varnish. Following the first dip, coils are baked for 4 hours, then dipped and baked for 4 hours three additional times in two double Lydon

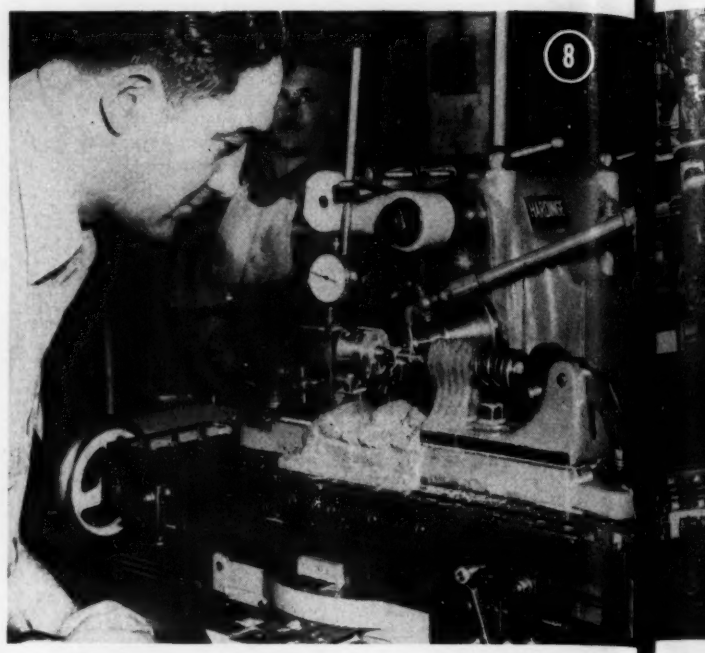
# Magneto Production

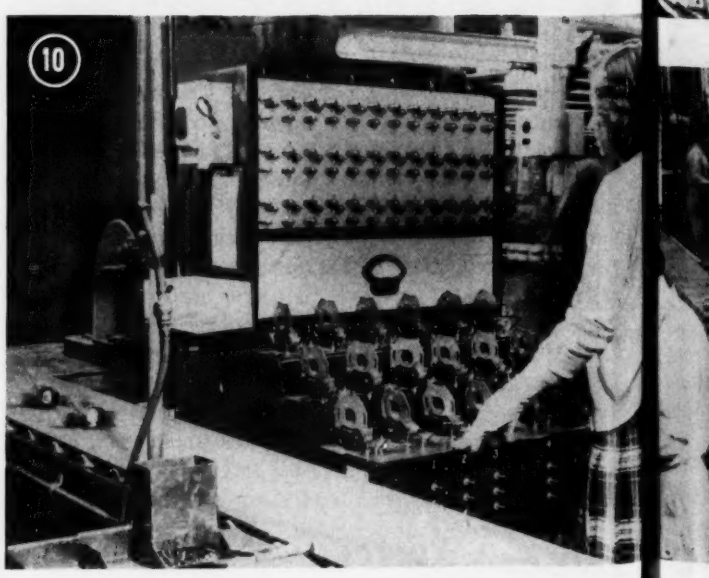
electrically-heated ovens at a temperature of 250° F. They are then completely wrapped with varnished cambric cloth and finish wrapped with nylon and cotton tapes. A new type molded coil already developed will eliminate many coil and subsequent assembly operations in the near future. Traveling through the general machine area, one sees the row of drill presses, Fig. 3, processing miscellaneous magneto parts. Heald Borematics and the nine milling machines, Fig. 4, also handle miscellaneous magneto components.

All laminations required for both the rotor and the housing of the conventional type magneto and for the stator of the fly-wheel type magneto, are produced on 25-ton Henry & Wright automatic feed presses as seen in Fig. 5. Laminations after being assembled with the core are die cast on the conventional type rotor shaft thus producing an integral part, Fig. 6. A Woodruff key seat in the conventional type rotor shaft is being milled by the operator in Fig. 8, while the face of the conventional housing is seen being milled in Fig. 7. Performing first operation machining on the magneto housing before it goes to the machining line, is a No. 4 Warner & Swasey turret lathe, Fig. 14, situated by the head of the conventional machining line. This lathe is used for both first operation and general machine work.

Fig. 11 shows the beginning of machining line for processing housings of the conventional type magneto. Roller conveyor with 2-inch center spacing is used for transporting housings to the next operation. Heald Borematics, shown in the foreground, bore several diameters simultaneously to a tolerance of 0.001-inch; also shown are drill presses, tappers, and the burr bench which completes the machining facilities for the conventional magneto housing. In all the machining operations carbide tipped tools are used wherever practical. After machining, housings are placed on a 75-foot powered belt conveyor on which the finished magneto is assembled. After magnification of the rotor is accomplished, the finished unit is put on a run-in stand subsequently going through four testing and inspection stations, Fig. 9, thus assuring proper electrical and mechanical functioning under the most severe operating conditions.

Required drilling and tapping operations are performed in the rotor after which the circular magnet is then riveted in place. Bullard Multaumatics, Fig. 12. perform all the machining operations required on the rotor for most types. Remaining turning operations are completed on a No. 3 Warner and Swasey lathe, Fig. 13. Key ways are then broached. The broach on the left of the conveyor may be used either on or off the line as required. The roller conveyor extends to the power conveyor of the automatic washer, eliminating the necessity of retaining an operator to feed the washer. Work emerging from the other side of the washer returns back onto the conveyor. After washing and burring are completed, the rotor's outside diameter is finished on an automatic polishing machine, Fig. 15, the circular magnet being subsequently





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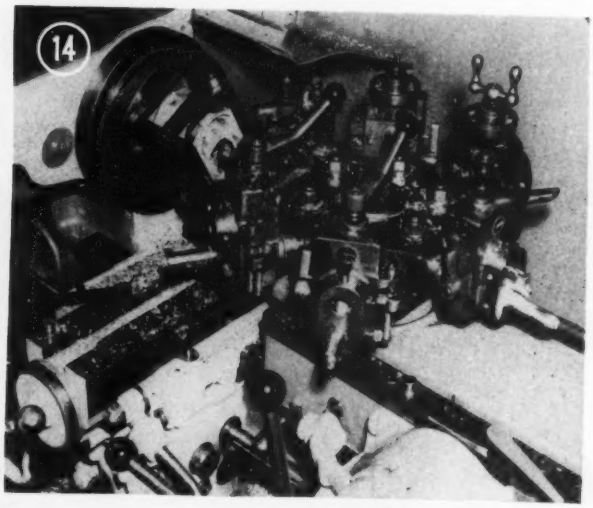
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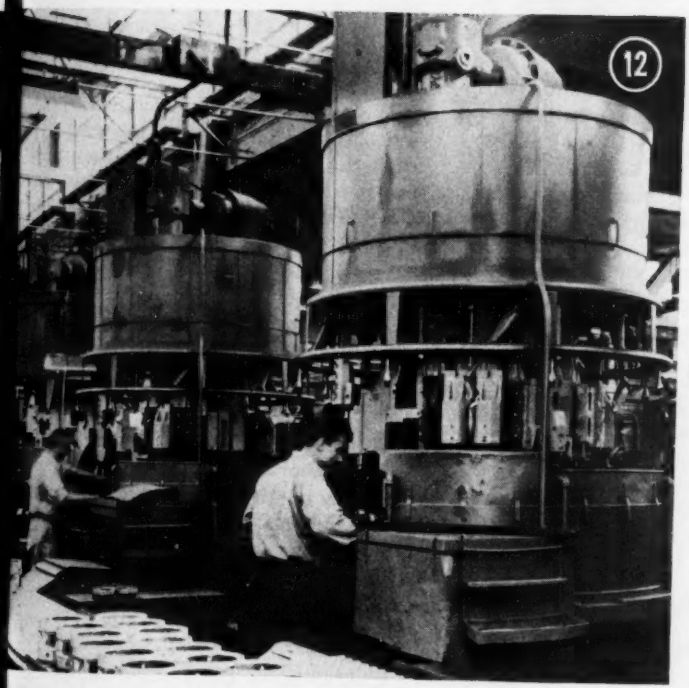
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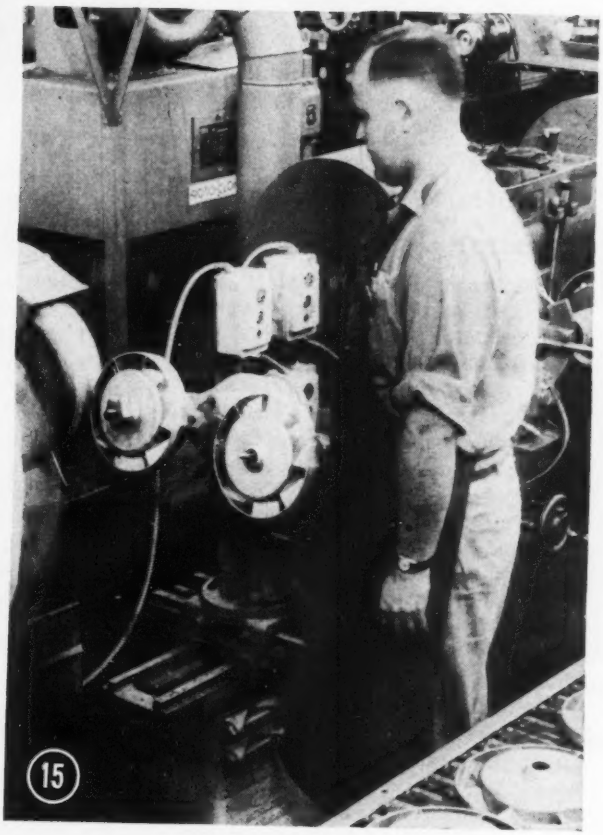
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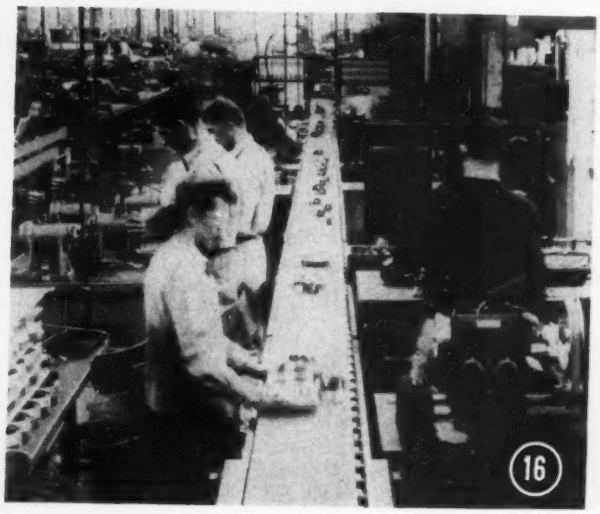
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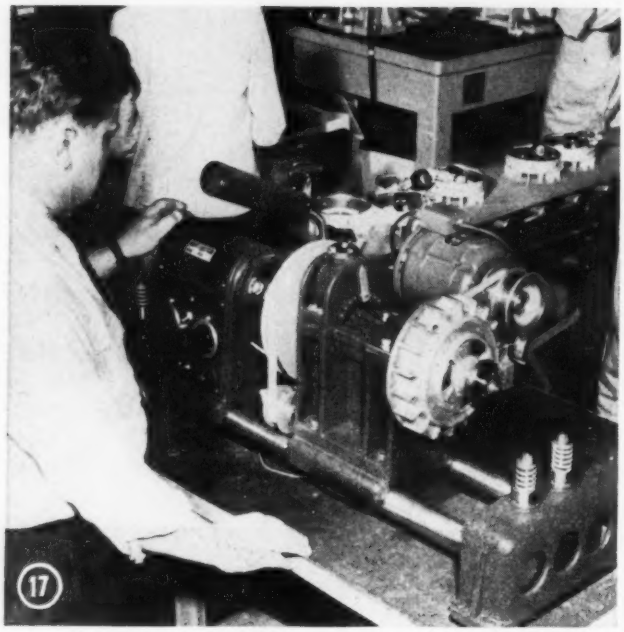


magnetized. The work is now placed on the power conveyor, meeting the stator plate coming down the belt conveyor. Subassemblies for the stator plate are made in the area immediately beyond the power belt conveyor, Fig. 16, after which stator plates are assembled and tested adjacent to the power conveyor line.

Illustration, Fig. 10, shows one of the many careful magneto division tests in which coils previously mentioned are being checked after assembly to the stator plate. Additional testing of the fly-wheel on an Annis balancer, Fig. 17, checks the accuracy of dynamic balance. An example of how this layout has eliminated much materials handling is seen in the punch press section where two Norton grinders are placed between two punch press operations, thus eliminating any backtracking of product movement. By the utilization of straight-line production resulting from the installation of this new layout, the company expects to increase 1948 magneto output in excess of 1947 which was 157 per cent above 1946.

## Advantages of Liquid Rheostat Described

Liquid rheostat speed control systems used mostly in motors ranging from 1000 to 30,000 horsepower in size are noteworthy for their stepless speed control, minimum maintenance and maximum dependability stated G. L. McFarland and William Alvarez of Control Engineering Division, General Electric Co., Schenectady, N. Y., at a recent meeting of American Institute of Electrical Engineers in Pittsburgh. The liquid rheostat is particularly suitable for control of larger motors particularly where other types of control cannot be used because of rating limitations.

Basically, liquid rheostats consist of electrodes which are movable submerged in a solution of sodium carbonate in water and stationary electrodes insulated from the steel in tank by an insulating cell. Resistance is approximately proportional to distance between electrodes. Electrolytic resistance properties depend on concentration of sodium carbonate and temperature of solution.

Smooth and stepless operation is provided by manual control system in which electrodes are positioned through the pilot motor rheostat, but accuracy of speed maintained depends upon constancy of load torque and electrolyte temperature. Smooth automatic positioning of electrodes to correct and maintain motor speed within precise limits is offered in the speed regulating control system in which pilot motor is energized by an amplidyne. Maintenance of constant input and prevention of excessive load on motor is possible with a third type of control in which torque motor on liquid rheostat is energized by an amplidyne which responds from control unit and compares load adjustment setting of load control rheostat with primary current.

T. B. Montgomery and A. C. Halter reported on a new liquid slip regulator design recently developed by Allis-Chalmers Mfg. Co., Milwaukee, which keeps one electrode below electrolyte to prevent flashover and in addition regulates length and area of current path between electrodes so that the desired speed versus rheostat position characteristics will be obtained. Possible applications of this unit include induced and forced draft fan drives, centrifugal pumps, blower and compressor drives.

## Quality Control Helps Defeat Inflation

Scientific methods increase production, improve quality, worker morale and decrease costs according to Jerome R. Steen, director of quality control, Sylvania Electric Products Inc., New York. Extension of the basic wartime method of quality control will effectively increase production by reducing wastage of still scarce or expensive material as well as worker effort.

Old methods of "inspecting out" defects do not build quality into every manufacturing step, he continued, and an application of the laws of probability frequently reveals that arbitrarily established specifications require that quality characteristics be maintained with unnecessarily close limits. Workers under the old method frequently are accused of poor workmanship beyond their control with resultant lowering of worker morale.

Modern scientific techniques help industry all along the line particularly with the consumer who receives better average quality. In this way, he concluded, one of the most difficult inflationary trends, a combination of raised product costs and lowered product quality, may be combatted.

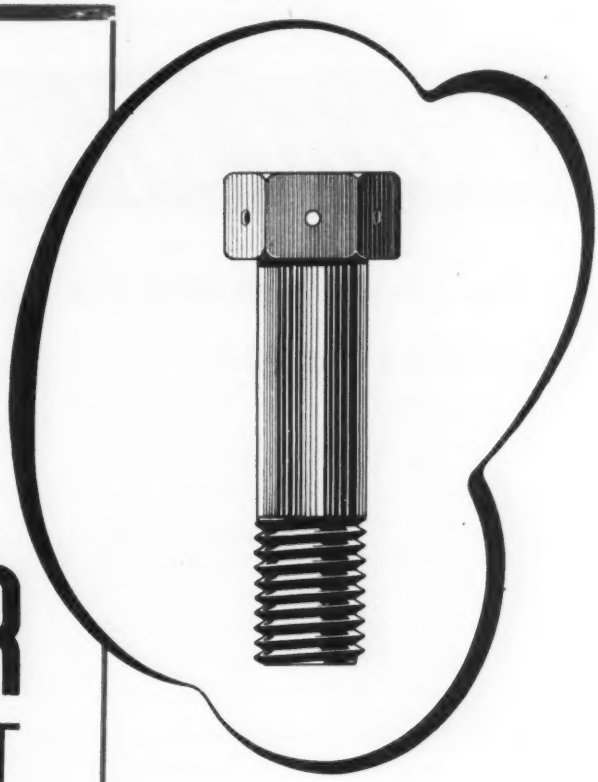
## Toolmaking Handbook Now in Revised Edition

Advances in tool design during the last 10 years have added to responsibilities of the tool and die maker. New and improved steels and new types of heat treating methods have appeared. These factors have made necessary a revised edition of "Tool Steel Simplified" now available from Carpenter Steel Co., Reading, Pa.

Contained in the revised handbook is practical information that can simplify the job of getting better, longer lasting tools and dies. Diagrams, charts, photographs and tables are used to drive home important points.

Skilled toolmakers will find information on air hardening steels, a new approach to hardenability (hardening penetration), a chapter on high speed and hot work steels, an alphabetical tool steel selector and other features. Younger men will find that the volume takes them along to an understanding of tooling operations step by step.

Authors of the handbook are Frank R. Palmer, vice-president of the company, and George V. Luerssen, chief metallurgist.



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# Light Metals

## In Automotive Construction

By CLAY P. BEDFORD
*Vice President*
*In Charge of Manufacturing*
Kaiser-Frazer Corp.
Willow Run, Mich.

*Progress made by Kaiser-Frazer in adopting such light metals as aluminum and magnesium for important auto components*

*Fig. 1 (left)—Worker here balances four 8-pound die-cast magnesium wheels in his left hand almost as easily as he hefts conventional 18½-pound steel disk in his right. Still in development stage, light wheels provide an unsprung weight savings of 10½ pounds per wheel or 42 pounds per car—reducing tire wear and offering smoother ride*

INDUSTRY today is at war just as surely as in 1944—at war with outmoded ideas, outworn prejudices and outrageous shortages. Not a whisper of a chance of winning this war exists if it is to be fought with outworn tools, outworn methods and outworn materials.

One of the first things to do is to supplant heritage-riddled planning. For example, certain early American automobiles actually were equipped with whip sockets as a concession to horse-and-buggy tradition; and, more recently, the long, high hoods which auto designers have considered essential for styling beauty, and which owners considered an index of personal wealth. The nonfunctional radiator hood ornament, a vestigial remain of the radiator cap, is another example.

In this connection several new projects are under way at Kaiser-Frazer right now, projects involving new developments in tooling because they deal with new applications of relatively new materials.

No one needs any introduction to the shortage of steel existing today, which has existed for the past two years, and which we believe will continue for some time to come. Kaiser-Frazer, being a newcomer to the automotive manufacturing field, became classed among those other new businesses which some steel companies felt unable to sell until prewar customers' requirements had been met. It, therefore, became apparent that K-F production would have among its limiting factors, and probably as its most limiting factor, the shortage of steel.

During the war the ingot capacity for aluminum and magnesium in this country was expanded greatly. Because of the light weight of these materials and other desirable characteristics, attention was naturally turned toward the use of aluminum for automobiles. True, the use of aluminum in automobile bodies is not new. Both in this country and in Europe it has been used off and on for a good many years. In this country, the cost has always been prohibitive. Due to the different economic conditions in Europe, it has been more feasible to use aluminum there for this purpose, and several successful cars have been produced in considerable numbers.

Even before production was under way at Willow Run we built a Kaiser car with an aluminum body. The body was entirely too expensive. We had trouble with loose metal in the doors and "oil-canning" of the surfaces. We found the welding to be slow. We found the bonderizing setup for steel bodies was not applicable to aluminum in its present form—*but* we found the building of these pioneer aluminum automobiles stimulated new ideas as to methods which might be employed to solve the problem of how to use light metals as a substitute for steel in automobile manufacturing.

In the meantime, by purchasing or leasing basic material sources, it was possible to obtain raw materials which permitted us to proceed with the manufacture of the Kaiser and Frazer cars in steel. We did this by trading these raw materials for finished products with those steel companies whose raw materials were in short supply. An additional supply of slab steel has been shipped in from the Kaiser Fontana steel mill, near Los Angeles, for conversion into sheet, making a costly end product.

In spite of success in increasing

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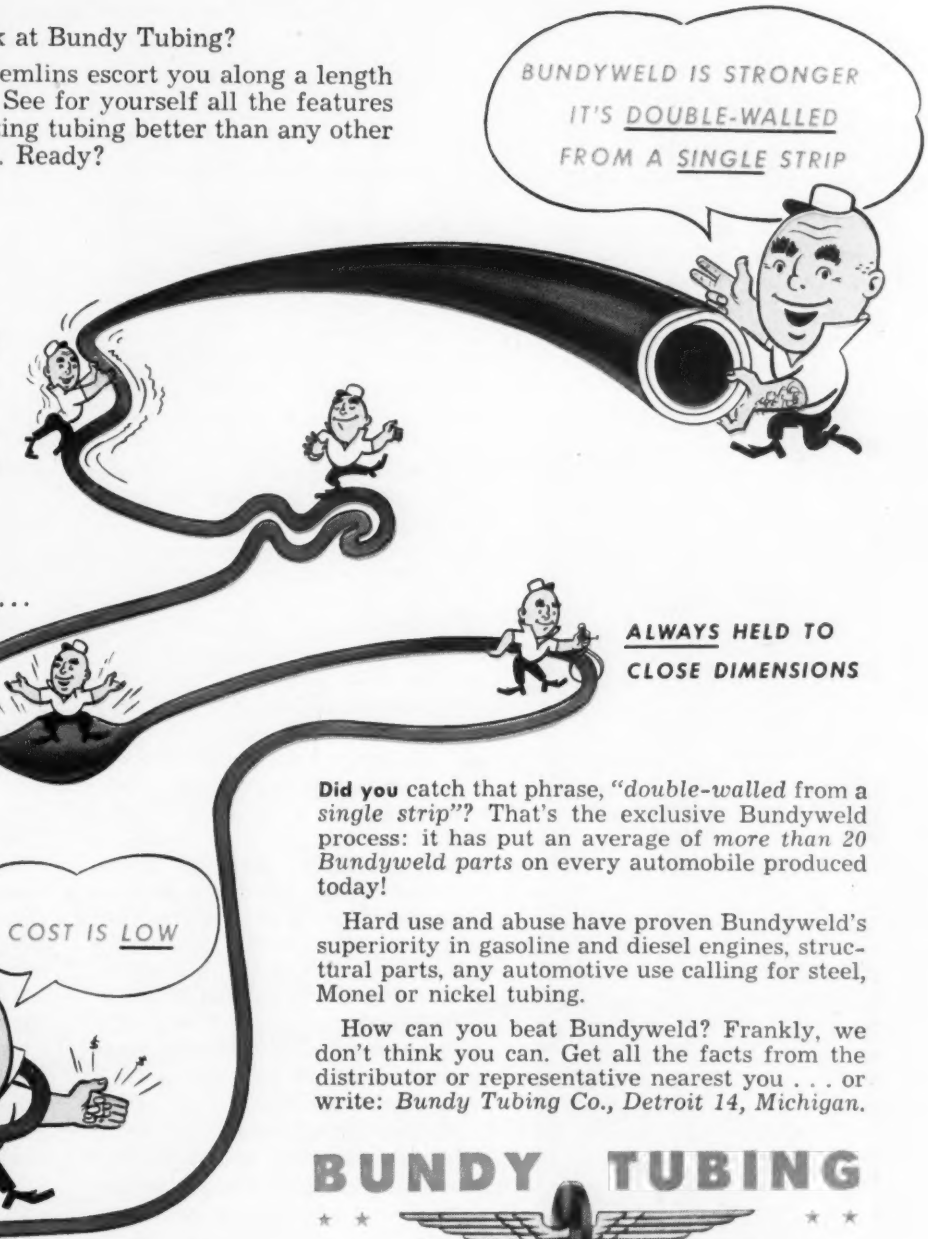


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*Bundyweld nickel and Monel tubing is sold by International Nickel Company distributors in all principal cities.*

production by the use of steel thus acquired, we did not believe the cause of light metals was lost, and so we continued, but with less urgency, the search for practical applications of light metals. After much trial and error we decided we must find an application which would permit the offsetting of the high cost of the light metal by a saving in labor which went into fabrication. Such a search quickly resulted in investigating die casting with the assistance of Doehler-Jarvis.

First attempts at die casting convinced us the process was not sufficiently advanced to provide thin sections with surfaces suitable for the outer skin of an automobile body. Furthermore, the bonderizing problem remained. Because of their peculiar advantages to the car owner we had already made trial applications of aluminum for hoods and decklids. Obviously, an aluminum hood or decklid is easier to lift. Smaller hinges are permitted; and use of the new metal lightens the car. Of course, lightening the car in the hood, decklid, doors and instrument panel not only increases the horsepower per pound for the car, which increases performance, but obviously it also lowers the center of gravity. We manufactured both decklids and hoods on a trial basis and put them on cars, but such trial manufacture convinced us the cost was out of line with steel and could not be afforded at the present cost of aluminum, although the manufacture was perfectly feasible from an engineering standpoint.

*Fig. 2 (above)—Aluminum alloy sheet gasoline tank weighs about 9 pounds. By eliminating inside baffles and changing to roll seam rather than seam welding, weight and cost of tank is hoped to be reduced still further. It is now being used on one-third of all production*

As a matter of interest, we also made some hoods out of glass cloth reinforced plastic; but here again it did not appear that, even under high production methods, the development had reached a stage which would permit us to achieve competitive cost within a reasonable length of time.

We then made a cost analysis of the various parts of the car which could possibly be made of aluminum, and determined that the gas tank appeared to be the largest part which could most readily be made competitively from aluminum sheet. This was partly due to the high cost of terne plate, but it was also due to the fact that we anticipated being able to make a practical gas tank with a minimum of welding. Welding has previously been one of the high cost features of aluminum fabrication. Our aluminum gas tank is now being tooled for a third of our production and that one-third should be in full production early in March. The steel tank weighed 28 pounds in terne plate and 11 pounds in aluminum, and by removng baffles the aluminum tank will weigh a net of about 9 pounds. We anticipate shortly being able to make this tank with a seam instead of welding, which will further reduce the cost and make it even more competitive.

Peculiar points which led us to select wheels, doors and instrument panels for development in light metals were a little different in each case. Wheels were selected because of the advantage of reduction in tire wear, improvement in riding quality and labor saving in fabrication. Also the fact that die cast magnesium tail wheels had been used on large bombers during the war indicated that a minimum of development would be required to achieve a practical result. We have had sand cast magnesium wheels operating successfully on test cars for several months. We have die cast magnesium wheels which have now been delivered to us and are going through strength and fatigue tests, as well as corrosion tests, and tests for life of lug bolt holes. From a cost standpoint, it appears that wheels may be uneconomical for mass production at present labor rates. But any further increase in fabrication labor costs or increases in the cost of steel or reduction in cost of magnesium will make them economically practicable, even without considering wear and tear on tires and improved operation. Besides this, the decrease in unsprung weight will result in a better ride.

Steel wheel weighs 18-1/2 pounds, while the magnesium wheel weighs only 8 pounds, which creates a saving in unsprung weight of 10-1/2 pounds per wheel or 40 pounds per car, a definite advantage in operation, the exact extent of which we are in the process of developing by experience runs on test cars.

Magnesium was chosen for this purpose rather than aluminum because of its lighter unit weight and greater ability to absorb shock. In this case the difference in cost was small per wheel as the cost strength ratio is about the same as that of aluminum.

We next tackled doors, since here die cast parts could eliminate a great deal of the fabrication and labor cost which goes into a steel door and would make door fits—the bodymaker's bugaboo—much easier. The doors posed a problem because of the special bonderizing treatment involved. We finally fell on the idea of placing a steel skin, hemmed into an envelope over a die cast aluminum frame. The first door frames made were aluminum sand castings. These were hemmed in a standard steel outer panel. Doors made in this fashion were put on endurance tests on opening and closing and slamming, and have proved practical and satisfactory for automotive use.

Estimated cost of the combination steel outer panel and die cast inner frame is approximately equal to the cost of doors made under standard methods if we must take the additional freight cost for raw steel shipped from California. This was sufficient incentive to warrant having a set of die cast door frames developed. The dies for these door frames are now in process, and we anticipate they will be ready for production runs in June. This does not mean we shall immediately begin installing die cast aluminum frame doors on cars, but it will be a substantial step in that direction. Because they are more simply adapted to die casting, the rear doors are being developed first. The comparative weight on the combination die cast aluminum frame door with steel

*Efficiency goes up—Costs go down with*

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Large or small, few or many—the efficiency and safety of your cranes and hoists are determined by the service life of the wire rope used. Maintenance costs on your equipment, measured in ton-miles or hours of operation, can be reduced by using the best wire rope—J&L Precisionbilt Permaset Preformed Wire Rope. Our engineers will be glad to survey your equipment and make recommendations that will reduce your costs. Write today for complete information.

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outer panel and with the present door is as follows:

Rear door in steel, 68 pounds; in aluminum about 53 pounds, or a total weight saving per car of 30 pounds for rear doors only. Since front doors weigh more than rear the total potential savings per car for all four doors is 67 pounds.

Besides those advantages already mentioned, there will result fewer door parts, better interchangeability, better door fit, quicker door fitting of hardware and accessories and better weather sealing.

As soon as development proceeds a little further with the die cast frame doors, if the results are as good as we anticipate, we will make dies for die casting of the instrument panel and will try the application of the die cast frame, plus steel skin, to the manufacture of the decklid. The results of the application to the instrument panels include shapes and contours with re-entrant angles and styling features not now practical by the use of steel stamping. The die casting will permit fabrication of the instrument panel in its final form; ready for more accurate assembly of instruments. The openings will be more precisely located and better formed, and should permit the easier assembly of instruments to the panel and a more finished job.

Design of these tools has been interesting. Doehler-Jarvis, primarily, is associated in the development of these die cast products, and has developed a high-pressure, cold chamber die casting machine especially for this work.

Machine for making doors has 48 by 48-inch die opening and has 424 tons closing pressure. Operating rate is 50 strokes an hour, and the anticipated yield is an average of 30 pieces per hour, requiring four presses for a production of rear doors for 500 cars a day.

It cannot be expected that automobile bodies will soon be composed principally of light metals. The reason is apparent after consideration of the following figures. The present aluminum ingot capacity in the U. S. is about 2300 million pounds annually. If 5 million cars were to be made each year with only bodies made of aluminum, 5000 million pounds of ingot would be required, or about 200 per cent of the total capacity in this country. As for magnesium, in September, 1946, it was estimated there were 258 million pounds of economical annual capacity. Five million automobiles would use 160 million pounds for wheels alone. It is quite clear that light metal capacity must be expanded if automakers find substantial uses for them.

What are the practical considerations in any contemplated change-over to a new and better way of accomplishing a manufacturing operation?

First, there's the initial cost of the new machine tools.

Second, there's usually a loss to be taken on the tools and equipment which are to be replaced.

Unfortunately, it is this second factor which too often determines whether the new methods, regardless of their efficiency, are to be adopted at all. And the reason is that this machinery is carried on our books of account at many times its real value in terms of production efficiency and obsolescence. It must be carried at this inflated value because of our present short-sighted depreciation and amortization tax laws.

At best, the effects of traditional depreciation rates are a serious hindrance to replacement of worn-out manufacturing facilities. And when you add new technological developments which require complete new tooling for new raw materials, the effect is doubly restrictive, particularly in a highly competitive business in which production costs are all-important.

The answer, of course, is a change in depreciation and amortization regulations which will allow industry to write off on a short-term basis the investment which it requires to expand facilities to create new productive power. A sound new program which will provide for accelerated depreciation will better enable small as well as large industries to take the investment risks necessary.

From address before Cleveland chapter American Society of Tool Engineers, Feb. 13, 1948.

## Phenolic Resin Used as Core Binder

A phenolic core binder which imparts enough dry strength to core materials to allow core to be handled while it is still warm was developed recently by General Electric Co., Pittsfield, Mass. Minimum baking time and temperature is said to impart sufficient strength to withstand pouring temperatures of 2750° F. Designed to have a low hot strength and excellent green strength, core binder evolves very little gas during powering and will not impair properties of core material after shakeout.

—o—

To save mental work for draftsmen and machinists a chart for the adding and subtraction of fractions has been developed by H. M. Edmunds Co., New York. For addition the two fractions are selected on edges of chart. By following a diagonal line from intersection of horizontal and vertical lines, answer appears on bottom line if it is less than one and top line if it is over one. A series of fractions may be added successively without writing down any of them.

## NEW LITERATURE

MATERIALS HANDLING EQUIPMENT
By Revolvator Co., North Bergen, N. J. Two additions to looseleaf catalog on Model G Red Giant hand liftruck and portable elevators.

CASE HARDENING
By Surface Combustion Corp., Toledo 1, O. Bulletin No. SC-127 describes case hardening in the standard rated furnaces. Four pages, illustrated and also contains table of pot recommendations.

STORAGE BATTERIES
Gould Storage Battery Corp., Depew, N. Y. Catalog No. 1000 contains details and illustrations of Gould Plants, Kathanode Glassklad and Dreadnaught, the three types of batteries available.

SAFETY EQUIPMENT
By Mine Safety Appliances Co., Pittsburgh 8. Catalog 6-B, 178 pages, describes and illustrates complete range of the company's safety equipment for industrial application.

IES LIGHTING HANDBOOK
By Illuminating Engineering Society, 51 Madison Ave., New York 10, N. Y. Condensed handbook giving accumulated knowledge of past 41 years of lighting progress, evaluated and interpreted with respect to today's needs.

SAFETY RELIEF VALVE
By Cochrane Corp., 17th street and Allegheny avenue, Philadelphia 32. Publication 4150 tells story of Multiport safety relief valve, giving numerous applications in relief of steam, air, gas, gasoline and oil vapors, water, etc. Also includes sizing data on relief valves.

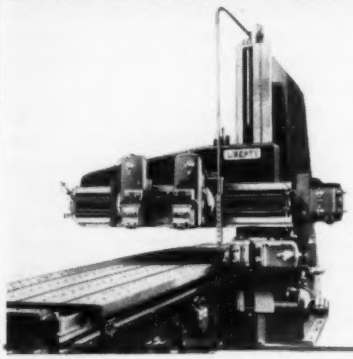
MOTOR GENERATORS
By Electric Products Co., Clarkstone Road, Cleveland 12. Bulletin 202 describes construction of motor generators for various electrolytic processes.

MOLYBDENUM IN CAST IRON
By Murex Limited, Rainham, Essex, England. Folder discusses effect of molybdenum on cast iron, tensile and transverse strength, hardness, mass effect, resistance to abrasion and advantage of its use.

"O" RINGS
By Parker Appliance Co., 17325 Euclid Ave., Cleveland 12, Ohio. Bulletin 920 gives dimensional information and prices on company's "O" rings.

OFFICE EQUIPMENT
By Precision Equipment Co., Long & Schubert Aves., Chicago 39. An 8-page catalog of office equipment and furniture featuring steel shelving and steel storage cabinets.

# LIBERTY BUILDS 3 *great* PLANERS



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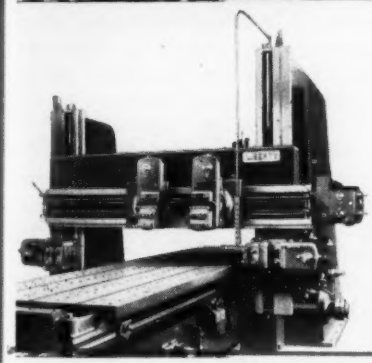

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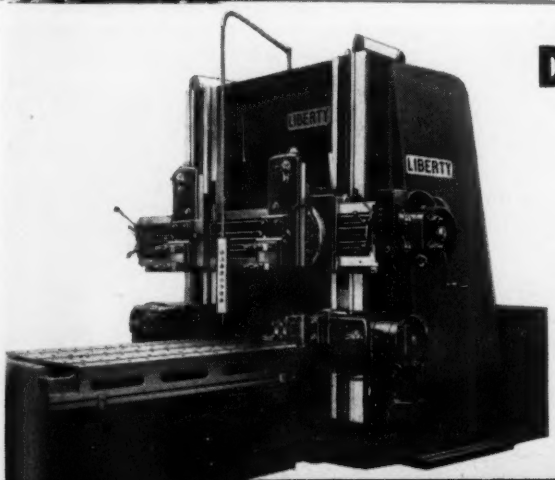


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For rapid production combined with accuracy. Two, three or four heads. Extremely rigid; handles production work with maximum cutting feeds and speeds. Table pulled into tool. Electric clamping and dual control for ease of operation; high production.

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***Exclusive Representatives in All Principal Cities***

# Automatic Mechanical Ladling

*. . . in die casting eliminates manual ladle-to-injection chamber transfers. Castings produced at rate of one or two per minute*

By E. F. ROSS
*Chicago Editor, STEEL*

IN LARGE size die casting machines, making castings weighing several pounds at each injection, it is desirable to provide some mechanical means for introducing or ladling molten metal into the injection chamber. To transfer the necessary amount of metal from a holding furnace to the chamber manually would require a ladle weighing more than a man could handle without excessive fatigue. Furthermore, the operation would be hazardous.

New and novel method for accomplishing automatic ladling was developed recently by Hydropress Inc., New York, for use with a large aluminum die casting machine which the company built for Aluminum Goods Ltd., Toronto, Ont., subsidiary of the Aluminum Co. of Canada. In its simple elements, the arrangement is merely that of providing at one end of the casting machine an elevated tilting melting furnace which transfers metal to a stationary holding ladle or metering device from whence by valve control the metal flows by gravity down a trough into the injection chamber.

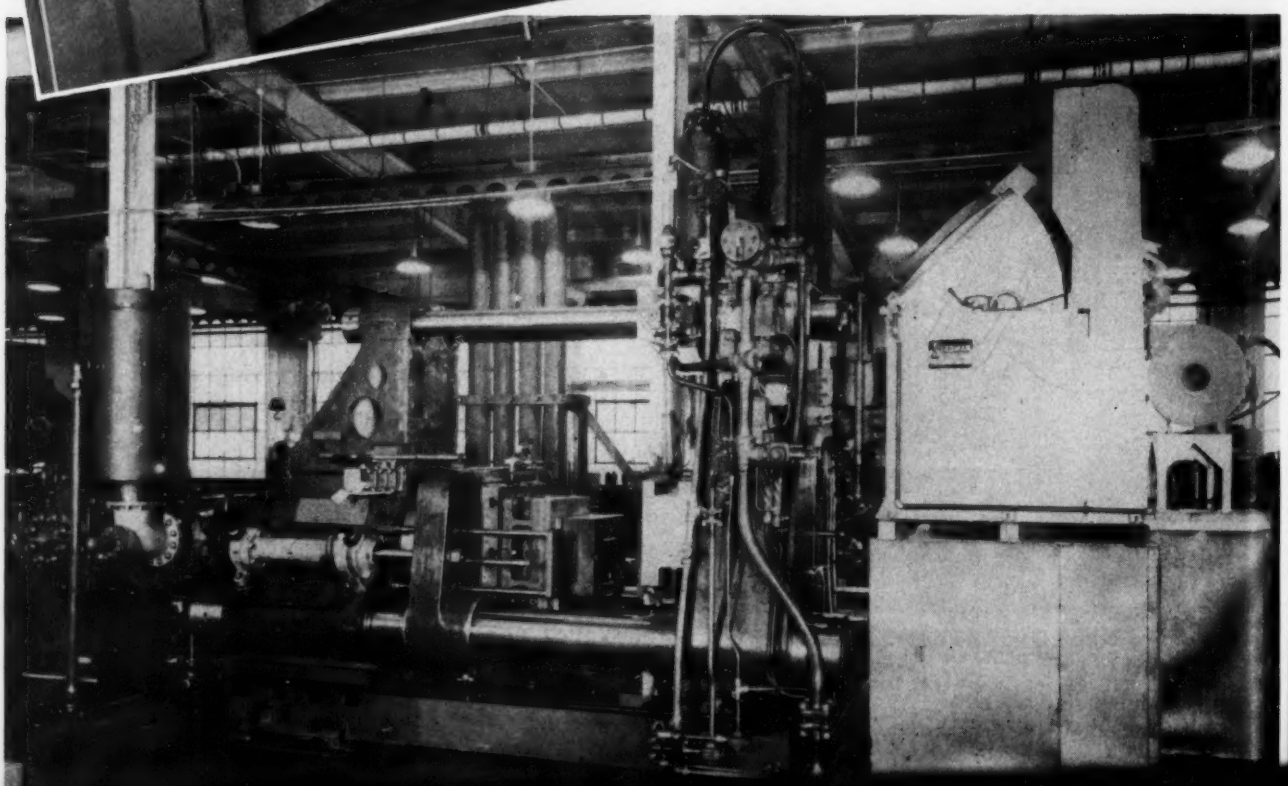
The die casting machine itself is a standard model No. 4 Hydrocast cold chamber unit capable of making aluminum alloy castings of 150 cubic inches volume and weighing 15 pounds. It is of horizontal design with a vertically arranged injection chamber. Die consists, as usual, of a stationary part and a movable part. The movable part is connected with the ram of a horizontal hydraulic press which provides for opening and closing the die, and for keeping the die tightly closed during moment of injection.

To the stationary die part is attached a vertical cylinder with a piston set in the bottom of the cylinder. This cylinder is the cold chamber which is filled with metal for injection. The cylinder is connected with the die by a nozzle. The bottom piston is supported by a spring in such a way as to close the nozzle and prevent the metal from entering the die. A snugly fitted upper piston is operated by the vertical hydraulic press. As soon as the upper piston descends, the lower piston is pushed down, establishing connection with the die, and the metal fills the die cavities under the resultant high pressure.

After injection is completed, the excess metal in form of a solidified disk, or biscuit, is automatically sheared off by the mounting lower piston

*Directly below is nose-pour furnace mounted on platform elevated about 8 feet above floor level. Stationary holding ladle is located just below maximum tilt of melting furnace attached to vertical hydraulic press. Shown at left is opposite side of furnace*





and is ejected from the injection chamber. Final operation is to open the die and eject the casting.

The machine delivers a total injection pressure of 80 tons and the speed of the upper piston is 50 feet per minute. Total clamping pressure on the die is 1000 tons.

In development work on the automatic ladling feature, Hydropress made use of a hydraulic tilting, nose-pour furnace of 200 pounds capacity built by Stroman Furnace & Engineering division, Petersen Oven Co., Chicago. The furnace, designed to burn either gas or oil, has a No. 200 graphite crucible.

Furnace is mounted on a platform elevated about 8 feet above floor level and at the cold chamber end of the machine. Attached to the vertical hydraulic press and at a level just below maximum tilt of the melting furnace is a stationary holding ladle of heat resisting alloy cast iron which affords protection against molten aluminum. This ladle is capable of holding 15 pounds of aluminum and is electrically heated to maintain the metal at the proper casting temperature.

Connected to the ladle at the bottom is an electrically controlled valve which when actuated allows the molten aluminum to flow down a trough into the injection chamber of the casting machine. This trough also is heated to prevent loss of metal temperature.

Since castings to be made in the machine will vary in weights up to 15 pounds, it was necessary to provide an accurate means for controlling the amount of metal delivered by the melting furnace to the holding ladle for each injection. This was accomplished in a simple yet effective manner by supporting over the holding ladle two electrodes which can be raised or lowered at will. These electrodes are part of an 8-volt electrical circuit. When the level of the molten aluminum rises in the holding ladle to touch the electrodes, the circuit is closed, thereby automatically causing the melting furnace to halt its tipping and to return to normal position.

Through thermocouple control the melting furnace delivers molten aluminum at 1240° F. The holding ladle also is equipped with thermocouple to insure sufficient heat to prevent loss of metal temperature.

To make a casting, the machine operator depresses a foot treadle to close the die. Pressure builds up automatically to 2500 pounds per square inch. The operator again depresses the treadle increasing the holding pressure to 5000 pounds per square inch and admitting the metal. At this point the treadle is released and the metal is injected into the die at 80 tons total pressure. This is performed automatically by time relays. The final operation is to open the die and eject the casting. After each injection, the melting furnace automatically delivers another charge of metal to the holding ladle where it remains until needed for the next injection.

The machine is expected to make castings at the rate of one to two per minute. Assuming castings are of maximum weight of 15 pounds, metal requirements of the machine will total 900 pounds per hour.

## Condenser Tube Available For Severe Conditions

Availability of a cupro-nickel condenser tube for installations operating under severe conditions was announced recently by Revere Copper & Brass Inc., New York. Nominal composition of the new tube is 88.5 per cent copper, 10 per cent nickel and 1.5 per cent iron. This alloy was developed by British Non-Ferrous Metals Research Association.

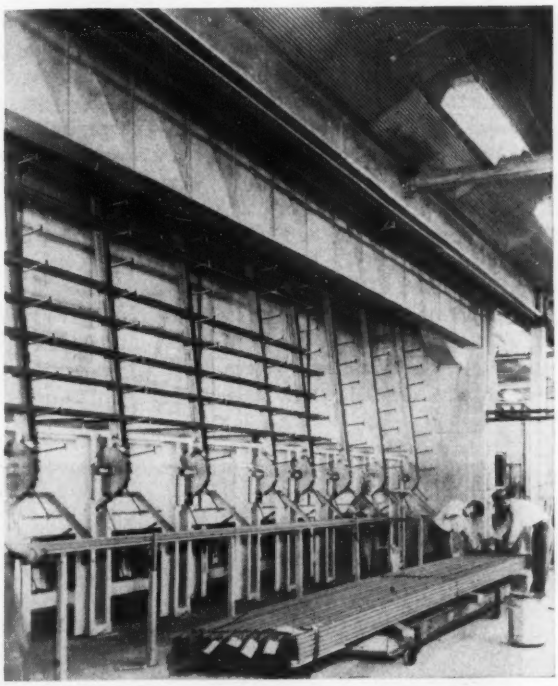
Company test installations of low cupro-nickel alloys have been in operation for periods up to four years. The new condenser tube is particularly recommended for marine and utility installations encountering high velocities, high temperatures brackish or salt water and bad pollution.

# Vertical Conveying System

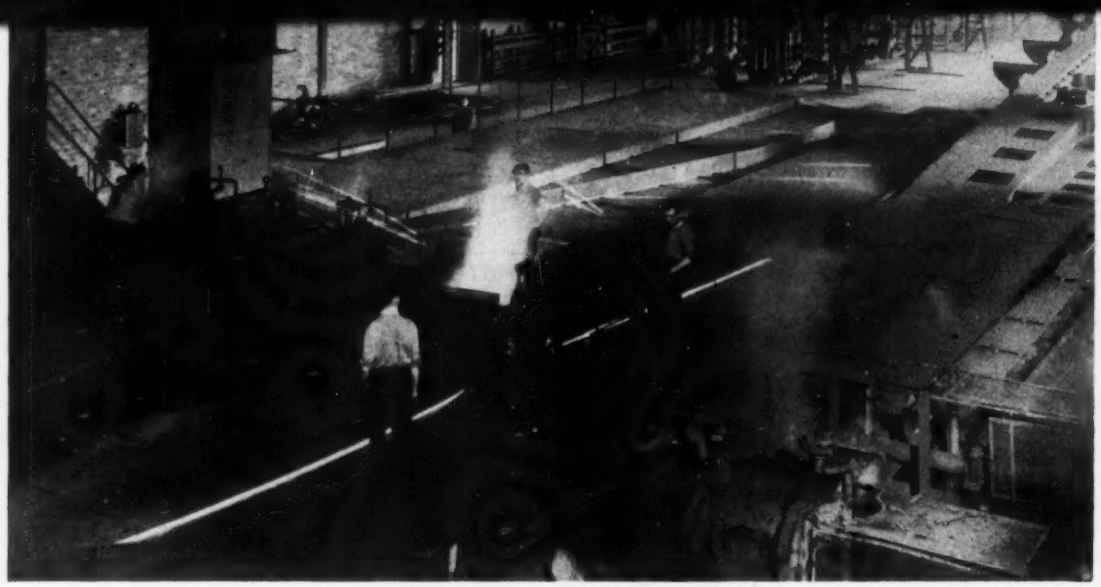
## . . . saves floor space in paint baking operations

LACK of floor space in plants need not handicap conveyor and oven operations if use is made of a vertical tower oven conveyor system developed by Ace Conveyor Industries Inc., Detroit. It includes a tower containing a Burdett equipped gas-fired oven, through which the conveyor runs, handling the painted work, to be baked or dried. System is flexible in that the tower can extend through the roof of the plant if necessary, and the conveyor is adaptable to meet almost any requirement.

One plant engaged in the manufacture of straight structural steel pieces uses the conveyor system to dry the rust-proofing coat of red-oxide paint in which the steel is dipped prior to entering the conveyor system. Work is carried from dipping operation on a roller conveyor and is kicked off automatically onto an entry conveyor. Entry conveyor is timed with the vertical-tower-oven conveyor so that, as pieces of structural steel move forward on the entry conveyor they are picked up automatically by the extended pins on the vertical conveyor chain. The pieces are then carried up one side of the tower, through the baking cycle, turned over at the top,



and carried down the other side, as shown in the accompanying photo. The oven is an integral part of the tower. Extended pins on the nine strands of the conveyor chain handle the work through all operations in the tower.



## New British Mill

# ROLLS LIGHT SPECIAL SECTIONS

*Two stand roughing, 3-stand intermediate and 2-stand finishing mill with average production of 75 tons per turn serves metal window and automotive industries. Table rollers individually driven. Rolls are changed by substituting complete set of spare housings equipped with rolls of desired pass dimensions*

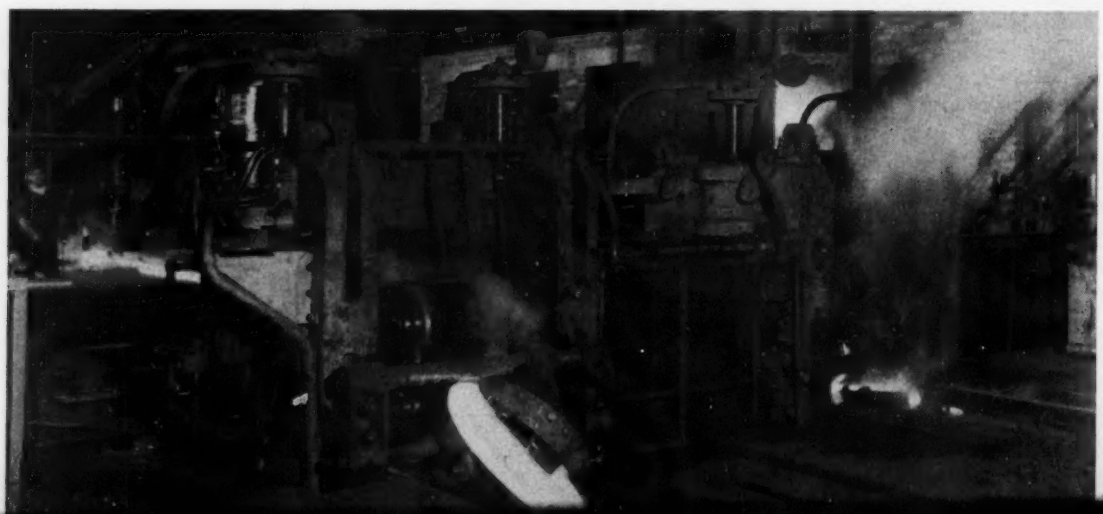
A NEW precision mill recently was placed in operation at the works of Darlington & Simpson Rolling Mills Ltd., for rolling of special small sections. Output of this mill is more than four times that of the older mills with approximately the same number of operators. The company was formed in 1935 to acquire the share capital of the Darlington Rolling Mills Co. Ltd. and F. R. Simpson & Co. Ltd., of Oldbury, Birmingham, and also the business of J. & W. Marshall, Walsall, Birmingham. Darlington is a forging and railroad repair center in the north east of England, in the Middlesbrough district. Businesses taken over were old established firms, having originally commenced operations as manufacturers of puddled iron about 1868.

Development of the special section trade in Great Britain took place in 1928, when the Crittall Mfg. Co. Ltd. joined Bolkow, Vaughan & Co. Ltd. as partners in the formation of the Darlington Rolling Mills Co. Ltd. Previous to this date, the Crittall company largely depended on supplies from Germany where a special technique had been developed in the rolling of light steel sections to close tolerances. All the old rolling mills at Darlington were dismantled, and a modern 12-inch section mill of German design and manufacture was installed in 1930. In 1932 a second 12-inch mill was installed, this of British design and manufacture. About this time, Dorman, Long & Co. Ltd., having absorbed Bolkow, Vaughan & Co. Ltd., joined the Crittall company as partners.

In addition to the rolling of light special sections for the metal window industry, the company specializes also in light sections for the automobile trade and other industries. They also roll other products such as steel arches, light rails and corrugated

*Fig.* 1 (*above*)—*Three-stand intermediate mill (left) and 2-stand finishing mill (right) are equipped with 12½-inch diameter rolls*

*Fig.* 2 (*below*)—*Delivery side of roughing mill. Repeater for returning piece to the pass is shown on stand at left*



plates for the colliery trade. These latter products are rolled in a separate shop comprising two mills. Two shops are devoted to the rolling of the light special sections, one comprising three mills of the older type, and the other housing the new mill.

The new mill is located in the West works, which occupy 15.24 acres of a 74-acre site. The billet yard 400 feet long and 100 feet wide is served by a 10-ton electric overhead crane. In the yard, near the side of the building is the shearing equipment of a capacity of 450 tons, which cuts the 3-1/2-inch billets, which are then run out by roller gear to the furnace or to a stock pile. When 2-inch billets are used the shear cuts three at a time. From the roller gear an electrically-operated pusher passes the billets into the furnace; the main pusher motor is of 30 horsepower.

The reheating furnace, built by the International Construction Co. Ltd., is gas fired. It is 14 inches between sidewalls and 50 inches long. It is designed to give an output of 12 to 15 tons per hour, and is provided with hearth skids. The gas is fed from a Morgan 10-inch mechanical producer with an overhead coal bunker of about 50 tons capacity, the coal being fed by belt conveyor from the ground bin which receives the coal from drop bottom coal trucks. Coal consumption per ton of steel heated in the furnace is 100 pounds. Air for combustion is preheated in a metallic type Newton Chambers recuperator.

### Description of Roughing Mill

The original design of the rolling mills was made by the company in collaboration with the Brightside Foundry & Engineering Co. Ltd., who were responsible for constructing and assembling the plant. The roughing mill consists of one 2-stand 3-high 16-inch mill, the rolls having a length of 3 feet 6 inches. These two stands are mounted on a common bedplate. The rolls are driven by a 750 hp motor from 400 to 800 revolutions per minute, a reduction gear of 6.15 to 1. The mill speed is 275 to 550 feet per minute. Tilting tables are provided behind both stands and skid gears are situated in front and behind the roughing mill for moving the billets from one stand to the other.

Three sections follow the roughing mill stage: One intermediate mill and two finishing mills. The first stand of the intermediate train is in line with the second roughing stand, at a distance of 85 feet. The intermediate train has two 3-high stands and one 2-high stand, direct motor-driven through a gear box and pinions. The rolls are 12-1/2-inch diameter and 2 feet 6 inches long. The motor is of 600 hp running at 400 to 800 revolutions per minute, the reduction gear having a ratio of 3.2 to 1; the mill speed ranges from 390 to 780 feet per minute.

The first finishing mill is comprised of one 2-high stand, direct motor driven through gearbox and pinions. The rolls are 12-1/2-inch diameter and 18 inches long; the motor is of 600 horsepower, running from 400 to 800 revolutions per minute and the ratio of the reduction gear is 2.28 to 1; the mill speed is from 550 to 1100 feet per minute. The second finishing mill has one 2-high stand, direct motor driven through pinions. Here again the rolls are 12-1/2-inch diameter and 1 foot 6 inches long, but the motor is of 450 horsepower at 175 to 350 revolutions per minute, with a mill speed of from 550 to 1100 feet per minute.

### Stands Mechanically Fed

Roughing and intermediate stands are mechanically fed, but after the intermediate stand the half finished sections are guided into the rolls by hand, although roller gear is used for controlling the movement of the bars. The roller gear, ingoing and outgoing, is by individually motor-driven rollers with motors varying on different runout tables between 1/2 to 1 horsepower.

Roll necks of all the stands are fitted with Skefko roller bearings, the bearing assemblies being held in cast-steel chocks fitting accurately into the mill housings, and so fitted as to take the side thrust occurring in the course of operations. Adequate means are taken to adjust the rolls in order to maintain accuracy. Controls are operated by women and are located in elevated pulpits from which a clear view of the plant is obtained. An average of 80 seconds is required from the time the billet enters the first roughing stand to the time the finished section comes out of the last finishing stand.

For about the same number of operators at the stands (7 to 9 men) the output at the old mills is on average 18 tons per shift; at the new mill, the average output is 75 tons per 7-1/2-hour shift, the best shift being 111 tons. Roll changing is done on spare stands, a sufficient number of which are available; the rolls are mounted and adjusted on the stands, and a complete unit is lifted by crane and carried into position Great care is then taken in adjusting the guides for accuracy and smoothness of operation. The blank rolls are machined in the roll turning shop, at the side of the main building. The grooves for more than one section are turned onto the rolls, and it is part of the planning, when an order for new sections is received, to combine this order with others in turning the rolls. Once a roll has been turned for a certain set of grooves it cannot be modified. The company is equipped to roll about 500 different sections.

After leaving the final finishing mill the material is run onto a double-sided carryover type of mechanical cooling bed, 160 feet long by 26 feet 4 inches overall width. The two run-out tables are each fitted with cold shears and mechanical weighing pockets of a capacity of 4 tons. Necessary straightening machines are provided.

## New Base Suitable for Machining, Drawing Jobs

High in sulphur and saponifiable content is a new all-purpose cutting base for metalworking industries recently developed by E. F. Houghton & Co., Philadelphia. It can be diluted with either oil or water and used as a soluble oil on the most difficult machining operations.

Some of the advantages of this product, called Antisep, are: High refrigerating qualities, satisfactory lubricating properties to protect bearings and spindles of automatics, high rust preventive properties and easy cleaning from work because of its high emulsibility.

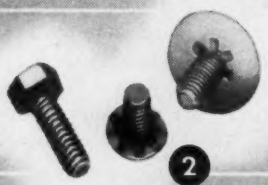
Versatility of this base is illustrated since it can be used in most metal cutting and forming operations including general machining, stamping and drawing. As a drawing compound it can be used straight, diluted with oil or water or a combination of both, according to severity of particular operation involved.

## Formed Metal Porcelain Standard Developed

Announcement of a commercial standard for formed metal porcelain enameled sanitary ware was made recently by Commodity Standards Division of National Bureau of Standards with release of edition CS144-47.

Adoption of the standard followed endorsement by all branches of the industry. It provides a uniform basis of quality for plumbing fixtures having an acid resisting porcelain enamel coating on an iron or steel base pressed to shape from sheet metal. Requirements include minimum thickness, quality of enamel coating, certain maximum tolerances and tests for enamel coating and warpage.

1 **AIRCRAFT PRODUCTS: AN Bolts, Nuts, Screws, Studs, Cotters (including Stainless Cotters)**



2 **SEMS—Pre-assembled Screw and Lockwasher units**

3 **SPECIALTY NUTS, including cone, barrel, plier, oblong, Tri-Slot, half-round**

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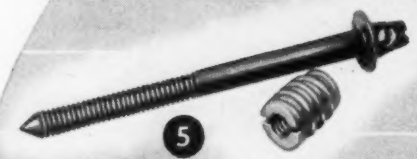
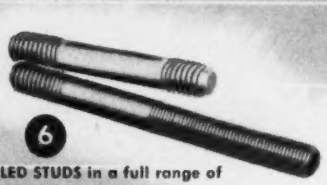


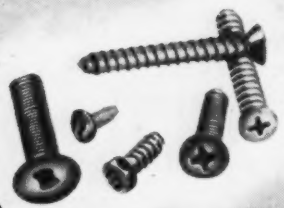
5 **FURNITURE BOLTS, Skein Nuts, Cabinet Bed Bolts and Bed Screws**



6 **MILLED STUDS in a full range of sizes**

7 **DARDELET RIVET-BOLTS with th locking thread . . . time saver for steel construction**

8 **WEATHER-TIGHT Bolts—*modern* fasteners for wood assemblies—eliminate counterboring**

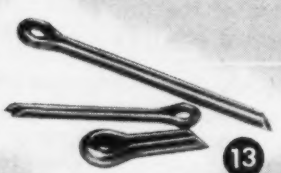


9 **PHILLIPS and CLUTCH RECESSED HEAD Machine Screws and Sheet Metal Screws**

10 **PLACE BOLTS—for locking assemblies rigidly**

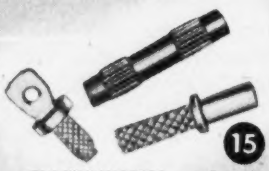
11 **"1035" SET SCREWS of hi-tensile heat-treated steel**

12 **ROAD MACHINERY and other heavy equipment parts—high tensile and alloy fasteners**



13 **COTTER PINS of steel, brass, aluminum and stainless steel**

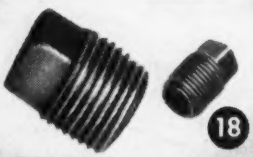
14 **LAMSON LOCK NUTS—One-piece, all-steel—can be re-used repeatedly**



15 **PLASTIC INSERTS—made to your specifications . . . in production quantities**

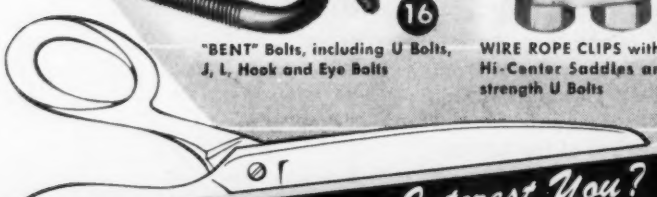
16 **"BENT" Bolts, including U Bolts, J, L, Hook and Eye Bolts**

17 **WIRE ROPE CLIPS with the new Hi-Center Saddles and extra-strength U Bolts**



18 **PIPE PLUGS, square head and headless; forged steel, heat-treated**

19 **LOK-THRED STUDS—Thread and *seals* in standard tap holes**



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1971 West 85th Street • Cleveland 2, Ohio

DON'T FORGET! Check the numbers on this coupon which correspond to the numbers of the fasteners above on which you wish more information.

20 **"BOLTS, NUTS & SCREWS"**—a compilation of import technical articles on the manufacture, inspection, spec cation and use of fasteners; order from The Lamson Sessions Co. at $1.50 per copy.

21 **"BOLT, NUT & RIVET STANDARDS"**—a complete and up-date standards book on commercial fasteners. Availa only from the American Institute of Bolt, Nut & Rivet Man facturers, Hanna Bldg., Cleveland, Ohio. $2.00 per co

TS • CAI … OTTER PINS • SEMS • KEY BOLTS • CHAIR and L … BOLTS
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FIN HEAD … CAPPED NUTS • SLEIGH SHOE BOLTS • STO … ARREL N
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# A Tough Combination TO BEAT!

It takes the right combination of special characteristics to make a top-notch Cap Screw. First it must be *tough*—tough without being brittle. Second it must be *strong*—strong enough to withstand extreme tightening. And third it must be *precision made*—headed, threaded and heat treated to precise specifications.

Lamson and Sessions pioneered the "high tensile" Cap Screw. Many years of bolt making "know how"—of experimentation, research and on-the-job testing stand behind the modern Lamson "1035" product.

Beginning with the raw material, Lamson metallurgists carefully control the quality of Lamson "1035" Cap Screws throughout the entire manufacturing process. The newest type of bolt making machinery assures precision accuracy in heading and threading.

Heat treating is done automatically, under carefully regulated atmospheric control, and regular laboratory tests double-check the accuracy of this modern equipment.

As a result of the painstaking care with which they are manufactured, Lamson "1035" high tensile Cap Screws embody the three characteristics of the "ideal" Cap Screw—*toughness, strength* and *precision.* It's truly "a tough combination to beat"!

**THE LAMSON & SESSIONS COMPANY**

**General Offices: 1971 West 85th Street, Cleveland 2, Ohio**

*Plants at Cleveland and Kent, Ohio • Birmingham • Chicago*

SPECIAL PURPOSE **Lamson+Sessions** FASTENERS

BOLTS • SEMI-FINISHED NUTS • LAMSON LOCK NUTS • MILLED S
LEVATOR BOLTS • STOVE RODS • TRACTOR BOLTS and HI-N BOLTS • SHE
CENTER BOLTS • HUB and WHEEL BOLTS • MACHINE SCREW LTS • BRASS
ARREL NUTS • OBLONG NUTS • CABINET BED BOLTS • AIR NUTS and SCREWS • S
SERTS • EYE BOLTS • CLEVIS PINS • HINGE PINS • TINNERS THUMB SCREWS • FIN HEAD BOLTS • S

# LETTERS *to the Editors...*

## The Case for Welding

Welding construction is being handicapped by code writers putting restrictions of no value, but of great expense, on welded structures made under their codes. Part of these handicaps come from the desire of certain manufacturers, equipped with certain unusual facilities, to exclude from competition those who do not have such facilities. Part of it is lack of knowledge on the part of the writers of the codes. Part of it seems to be plain cussedness. The following illustrations will show some of the distortions used to limit welding and to increase its cost.

The method of joining steel plates has been the riveted joint for generations. Results have been satisfactory, yet it is impossible to make a riveted joint as strong as the parent metal. It is however, impossible in mild steel to make a welded joint of equal sections which is not stronger and will not break the plate in tension. However, the code writers, in spite of these facts, make the following restrictions on welded structures:

If a welded joint is made of equal strength to a riveted joint, the riveted joint is accepted, the welded joint rejected.

If a welded joint is made of equal ductility to a riveted joint, the riveted joint is accepted, the welded joint rejected.

If a welded joint is made with the same undercut from caulking, as is normally done in a riveted joint, the riveted joint is accepted, the welded joint rejected.

If a welded joint is made with the same porosity as a riveted joint, the riveted joint is accepted, the welded joint rejected.

If Magnaflux or x-ray is used on a welded joint and it shows the same voids as it would on a riveted joint, the welded joint would be rejected, the riveted joint accepted.

If a welded joint is made with the same surface appearance as a riveted joint, the welded joint would be rejected, the riveted joint accepted.

If a welded joint is made with the same fatigue value as a riveted joint, the riveted joint would be accepted, the welded joint rejected.

If a welded joint is made with the same tightness as a riveted joint, the riveted joint would be accepted, the welded joint rejected.

If a welded joint is made with the same tendency toward caustic embrittlement as a riveted joint, the welded joint would be rejected, the riveted joint accepted.

There has never been a weld failure in any insured pressure vessel. In spite of this, progressively greater handicaps are placed on welding whose sole purpose is to make welded structures cost more. Already there have been billions of dollars unnecessarily wasted in this way.

Perhaps what we need is a new code for welding code writers rather than for welded constructions. Perhaps we can then deal with reality in this matter.

J. F. Lincoln, President
Lincoln Electric Co.
Cleveland, O.

## Received and Forwarded

On May 6, 1946, you published an article on page 155 of your magazine STEEL on a rustproof coating and you refer to the Banox process. Is it possible for you to put us in touch with Calgon Inc., so that they might inform us whether they have associations in Great Britain from whom we could get full details of the Banox treatment for steel and galvanized steel. We should very much appreciate your help.

S. F. Hannison
John Dickinson & Co. Ltd.
South Tottenham
London, N. 15, England

## Strip Mill Locations

We are interested in having the location of all steel mills that make hot rolled and cold rolled steel strip.

As regular subscribers to STEEL we will greatly appreciate your furnishing us with such a list or preferably a map showing the geographical location, if there is one available.

C. W. Gram
Animal Trap Co. of America
Lititz, Pa.

**STEEL for February 23 contains a special insert on the hot and cold rolled steel sheet and strip situation. You will find in it a complete and detailed list of all producers, plus their capacities. It also includes a map showing basing points.—The Editors.**

## The Man Is Right

After reading with a great deal of interest the "Joining and Welding" section of your January 5, 1948 (Yearbook of Industry) issue, I cannot understand why controlled atmosphere electric furnace copper brazing has been omitted completely.

Your own publication has carried numerous articles covering this modern and highly efficient metal joining process and these articles apparently indicate your own opinion that the method has outstanding industrial importance.

It would not have been a difficult matter to find a man well qualified to discuss copper brazing. Mr. Harlan Webber of General Electric Co. in Schenectady has lived with the subject for many years and could have presented a most interesting story.

We believe, and I believe investigation would substantiate our thought, that copper brazing is probably the most rapidly expanding of all steel to steel joining processes. It certainly deserved representation in your digest.

N. M. Salkover
Salkover Metals Processing
Cincinnati, Ohio

## National Castings Council

In your issue dated Febraury 2, 1948, in the article "As the Editor Views the News", I noticed your reference to the new foundry council which has organized the National Casting Council.

Can you advise me of the proper name for this council, the address and the name of the secretary.

O. A. Leach
H. Leach Machinery Co.
Providence, R. I.

**The formal name of the new foundry council is National Castings Council. The secretary is Frank G. Steinebach, editor, FOUNDRY magazine, Cleveland. Address him at Penton Bldg., Cleveland 13, Ohio. The story on this new foundry council will be found on page 73 of our February 2 issue.—The Editors**

## Pat on the Back

We wish to compliment your magazine on the fine constructive editoral matter that has been issued all through the year 1947 beginning with the March 17th editorial and on up-to-date.

I feel that the influence of STEEL on the current shortage in the metal market has been a most beneficial one and that you deserve commendation from everyone in the metal industries.

Tom J. Smith Jr., President
Pressed Metals Institute
Cleveland

## Elusive Spring Material

I am in need of a quality of spring steel the likes of which I seem unable to track down. Every steel company I write to says that the kind used in car springs is the best there is; that is, good quality automobile springs.

Would you inform me of someone who makes, sells or knows about a spring steel which when properly heat treated will have the following characteristics: Make a spring 14 inches long in the shape of a C with the distance between ends of 5 inches. Material must be 3/16 or ⅛-inch thick and of any width stock from 1 to 6 inches sufficient to permit the ends to meet. It must not break or bend out of shape and must flex a million times without breaking. Material for a similar spring with a distance between ends of 6 inches is needed. I will need about a million feet of the proper kind of steel.

J. Stewart Fenton
R.R. #2
Waterloo, Iowa

## Hot Pressing

(*Concluded from Page 92*)

practice to bury the forging in ashes immediately after the forging operation and allow it to cool in this manner to room temperature. For larger forgings such as the solid hub, this cooling operation required long periods of time, frequently as much as 2 weeks to 20 days.

Flaking trouble has also been overcome by giving the hub forging an isothermal treatment at a subcritical temperature immediately after the forging operation. This isothermal treatment, with a carefully controlled temperature cycle, not only prevents flaking but also results in a hardness that is well under the 229 brinell maximum that is required for satisfactory machinability of the rough forging. Accomplished in approximately 30 hours the isothermal treatment results in marked saving in flow time for cooling operation.

In addition to the weight-saving advantages that the present forging practice has over drop forging practice, on this part, a decided improvement in quality has been noticed in the resulting forging. Additional working the forging receives from hot pressing improves its physical properties.

**TABLE I**
**WEIGHTS OF SOLID AND EXTRUDED FORGINGS**

| |
|---|
| **Large three-way hub—solid** |
| 1400 pounds—required weight |
| 1220 pounds—net weight |
| **Large three-way hub—extruded** |
| 780 pounds—required weight |
| 575 pounds—net weight |
| **Small three-way hub—solid** |
| 335 pounds—required weight |
| 308 pounds—net weight |
| **Small three-way hub—extruded** |
| 230 pounds—required weight |
| 188 pounds—net weight |

**TABLE II**
**PHYSICAL PROPERTIES OF TEST BARS CUT FROM SOLID AND PIERCED BARREL FORGINGS, AFTER HEAT TREATMENT**

| |
|---|
| **Solid forging** |
| 140,000 p.s.i. |
| 14.7 elongation |
| 41.6 reduction of area |
| (28 tests) |
| **Pierced barrel** |
| 141,000 p.s.i. |
| 18.45 elongation |
| 55.7 reduction of area |
| (26 tests) |

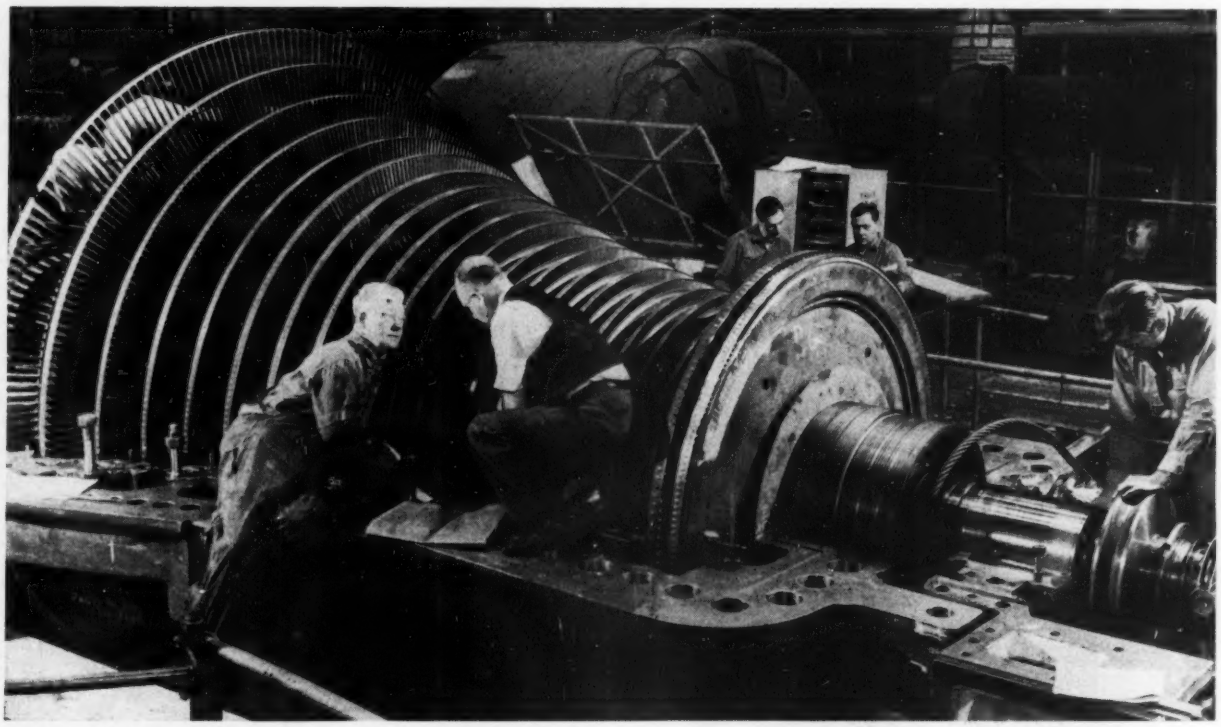
Table II shows typical physical properties of test bars which are cut from the solid and pierced barrel forgings, respectively, after heat treatment. These bars are taken from the finished forging in an area parallel to the propeller shaft axis and located between two adjacent barrels. The figures clearly show that for equal hardness and tensile strength the test bars taken from a pierced barrel forging show improved elongation and reduction of area values over the similar bars that have been taken from a solid forging.

Since instituting the hot pressing operation the Magnaflux rejections have been materially reduced. Any normal segregation in the center is broken up, dispersed, and the grain structure refined due to the additional hot working which the pressing operation performs. The extrusion of the barrels also results in a marked improvement in the grain flow pattern in the forging, Fig. 6

Normal Magnaflux rejections for solid forgings produced in a drop forge hammer was approximately 3 per cent. Experience to date with forgings produced on the new press shows a marked reduction in Magnaflux rejections which to date average less than 0.3 per cent. These are average figures for the several different models of hubs. Actual figures for the largest size hubs indicate a much greater improvement in Magnaflux quality resulting from this hot pressing operation.

—o—

Relatively low in pigment is the heavy duty drawing compound developed by Northwest Chemical Co., Chicago. Designed primarly for use without dilution, it may be thinned with up to two parts of water by volume to one of compound.



**SMALLEST OF SEVEN:** Although this 60,000 kilowatt generator is no midget, it is the smallest of 7 turbine generator sets built by General Electric Co., Schenectady, for Pacific Gas and Electric Co. of Cailfornia. Weighing more than 900,000 pounds, the set is 63 feet long and 22 feet wide. Included in the same order are one 80,000 and five 100,000 kilowatt turbine generator sets

# NEW *Life-Line* MOTORS
# NOW AVAILABLE

## WESTINGHOUSE NOW OFFERS *IMMEDIATE DELIVERY*
## ON *STANDARD* LIFE-LINE MOTORS . . .
## IN RATINGS FOR 60% OF INDUSTRY'S REQUIREMENTS

To meet industry's urgent need for more—and better—motors, Westinghouse embarked two years ago on the biggest engineering and manufacturing program ever undertaken in this field.

Industrial buyers were surveyed to find the improvements most desired in existing standard motors. These improvements were incorporated, for the first time, in a single motor—the Life-Line—*a motor designed, from scratch, to user specifications.*

To build the Life-Line motor, a complete new plant was purchased, tooled and equipped from the ground up, with machines and new techniques never used before to manufacture motors.

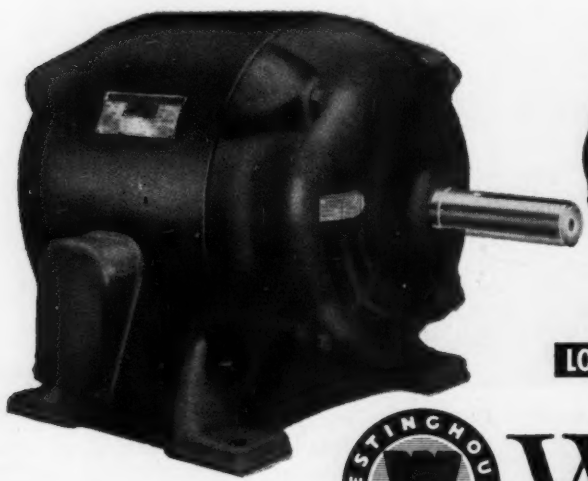
*Today, we announce the attainment of our first objective.*

*The new Life-Line motor is now available from stock in standard types from 1 to 15 hp.*

This objective was selected as of first importance, since 60% of standard, integral horsepower motors required by industrial users fall in this classification. Motor types included in stock are described on the opposite page. On "near-standard" motors, also described, short deliveries are available in these sizes.

Improved deliveries on special types and larger ratings will be the subject of future announcements, as quickly as increased output makes them possible. Watch for them . . . phone your orders from this stock list to your nearest Westinghouse representative. Westinghouse Electric Corp., Box 868, Pittsburgh, Pa.

J-21447-A



WESTINGHOUSE

# Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

# FROM 1 to 15 HP FROM STOCK

### WHAT IS MEANT BY "STANDARD" MOTORS

"Standard" motors include drip-proof, splash-proof, totally-enclosed, fan-cooled and some totally-enclosed, non-ventilated complete motors, ball-bearing type, having standard electrical characteristics (220/440 volt, 2 or 3-phase, 50 or 60-cycle, standard speed torque and time-temperature characteristics).

*Available from stock in ratings indicated below.* Very short delivery on any standard non-stock rating in these frame sizes.

### TYPES INCLUDED AS "NEAR-STANDARD" MOTORS

"Near-standard" motors are those with minor modifications, which include such items as double shaft extensions, NEMA standard B and C flanges, special No. 1 insulation, round frame, conduit box opposite standard, squeeze connectors instead of conduit box, TENV motors, partial motors, 50-cycle, 40° C. rise open motors, etc.

*Short delivery in frame sizes listed below.*

**Life-Line A-C, Single-Phase, 60-Cycle, 110-220-Volt, Heavy-Duty Type CAP Capacitor-Start, Induction-Run Motors**

| HP | RPM | FRAME | VOLTS | IN STOCK |
|---|---|---|---|---|
| 1 | 1750 | 203 | 220 | ✓ |
| 1½ | 1750 | 204 | 220 | ✓ |
| 2 | 1750 | 224 | 220 | ✓ |
| 3 | 1750 | 225 | 220 | ✓ |

**Life-Line A-C, 3-Phase, 60-Cycle, Squirrel-Cage Motors**

| HP | RPM | Frame | Volts | ENCLOSURE TYPES IN STOCK | | |
|---|---|---|---|---|---|---|
| | | | | Drip-Proof | Splash-Proof | Totally Enclosed |
| ½ | 860 | 204 | 220/440 | ✓ | | ✓ |
| ¾ | 1150 | 203 | 220/440 | ✓ | | ✓ |
| | 1150 | 203 | 550 | ✓ | | ✓ |
| | 850 | 224 | 220/440 | ✓ | | ✓ |
| 1 | 1750 | 203 | 220/440 | ✓ | | ✓ |
| | 1150 | 204 | 220/440 | ✓ | | ✓ |
| | 850 | 225 | 220/440 | ✓ | | |
| | 850 | 225 | 550 | ✓ | | |
| 1½ | 3450 | 203 | 220/440 | ✓ | ✓ | |
| | 1750 | 204 | 220/440 | ✓ | | ✓ |
| | 1150 | 224 | 220/440 | ✓ | | ✓ |
| | 860 | 254 | 220/440 | ✓ | | |
| 2 | 3450 | 204 | 220/440 | ✓ | | |
| | 3450 | 204 | 550 | ✓ | | |
| | 1750 | 224 | 220/440 | ✓ | ✓ | ✓ |
| | 1750 | 225 | 220/440 | | | ✓ |
| | 1150 | 225 | 220/440 | ✓ | ✓ | ✓ |
| | 860 | 254 | 220/440 | ✓ | | ✓ |
| | 860 | 254 | 550 | ✓ | | |
| | 710 | 284 | 550 | ✓ | | |
| 3 | 3450 | 224 | 220/440 | ✓ | | |
| | 3450 | 224 | 550 | ✓ | | |
| | 1750 | 225 | 220/440 | ✓ | ✓ | ✓ |
| | 1750 | 225 | 550 | | | ✓ |
| | 1135 | 254 | 220/440 | ✓ | ✓ | ✓ |
| | 875 | 284 | 220/440 | ✓ | | |
| 5 | 3450 | 225 | 220/440 | ✓ | ✓ | |
| | 1735 | 254 | 220/440 | ✓ | ✓ | ✓ |
| | 1735 | 254 | 550 | ✓ | | |
| | 1200 | 284 | 220/440 | ✓ | ✓ | ✓ |
| | 875 | 324 | 220/440 | ✓ | | |
| 7½ | 3470 | 254 | 220/440 | ✓ | | |
| | 1740 | 284 | 220/440 | ✓ | ✓ | ✓ |
| | 1740 | 284 | 550 | ✓ | | ✓ |
| | 1160 | 324 | 220/440 | ✓ | | |
| | 865 | 326 | 220/440 | ✓ | | |
| 10 | 3500 | 284 | 220/440 | ✓ | ✓ | |
| | 1740 | 324 | 220/440 | ✓ | | ✓ |
| | 1740 | 324 | 550 | | | ✓ |
| | 1155 | 326 | 220/440 | ✓ | ✓ | |
| | 870 | 364 | 220/440 | ✓ | | |
| 15 | 3500 | 324 | 220/440 | ✓ | | |
| | 1750 | 326 | 220/440 | ✓ | ✓ | |
| | 1160 | 364 | 220/440 | ✓ | | |
| | 1160 | 364 | 550 | ✓ | | |
| | 875 | 404 | 220/440 | | ✓ | |

*Subject to prior sale.*

**Life-Line motors**

**MORE PRODUCTIVE POWER FOR INDUSTRY**

## Spot Welding—*Continued from Page 95*

changes in material characteristics was demonstrated by securing weld strength data for both the "as welded" and "heat treated" conditions for both "hot rolled" and "cold rolled" materials.

Optimum carbon contents were by this means found to vary upward with thickness and to be different for the two tempers investigated. The upper suitable composition limits were determined for each thickness from a consideration of the metallographic structure, maximum hardness, freedom from cracking, general excellence of the "as welded" physical properties and the ratio of the 1150° F annealed to the "as welded" tension-shear strengths.

This article essentially defines a series of commercial problems. Different users of the spot welding process may prefer different solutions depending upon the application requirements, available equipment, production speed requirements and the availability of materials.

**Scope of Investigation**—Carbon variations of from 0.008 up to 1.09 per cent were obtained by the selective procurement of steels ranging from 0.015 up to 0.513-inch in thickness. Hot rolled, annealed and cold rolled materials in the form of sheet, plate and bar stock were used, depending upon availability.

Distribution of the thickness-carbon pattern was not as uniform as originally desired, but for practical purposes, the coverage is believed to be adequate to draw workable conclusions. It was not convenient to obtain precontrolled analyses for the usual secondary elements.

By arranging the carbon-manganese and carbon-silicon contents in the graphical forms shown in Fig. 2 it is apparent that definite interrelationships exist for each of these combinations for the materials investigated.

Manganese content for the hot rolled steels increased in a uniform manner with increases in carbon up to the medium carbon ranges, as shown in Fig. 2. Low manganese contents were furnished for the high carbon steels. The cold rolled steels were purchased to a 0.70 to 1.00 per cent manganese specification.

All of the medium and higher carbon steels were of the silicon killed type. The very low and low carbon steels were made to rimmed practice. Some of the intermediate analyses (0.15 to 0.31 per cent carbon) were silicon semi-killed steels. Phosphorus and sulphur contents were never over 0.040 per cent, with one exception for each element.

**Welding**—All surfaces were cleaned prior to welding by pickling, grit blasting or as the normal result of the original cold rolling or bright annealing operations.

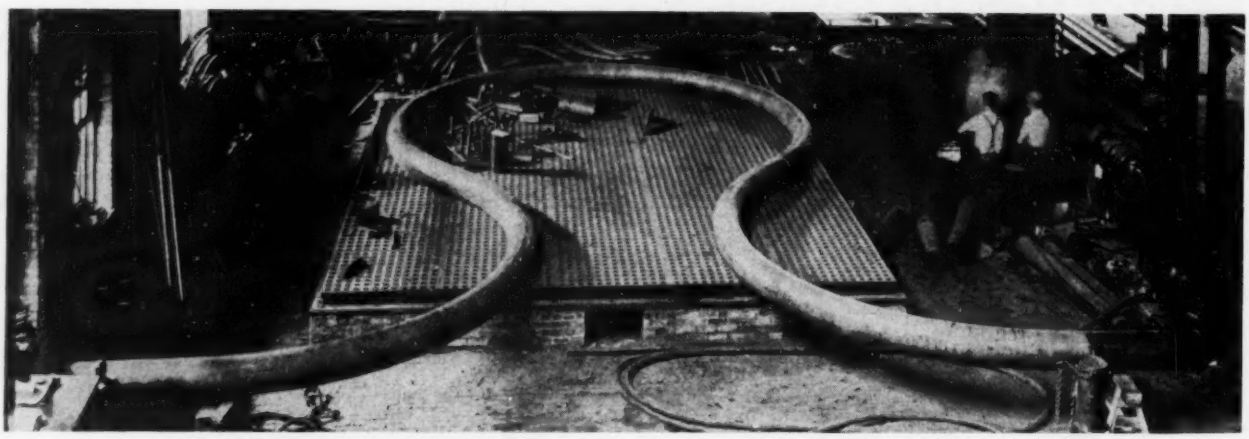
General conditions used for spot welding low carbon steels were those determined by a previous investigation. Heat energy input was, for each thickness group, just below that amount which would result in the expulsion of molten metal from the weld ingot. All specimens of any one thickness, regardless of composition or temper, were welded in the same machine at one set-up period with the same electrodes, cooling media and transformer tap settings.

Except for the ⅛-inch thick specimens the same welding times were also maintained for each thickness, regardless of composition or temper. This was done to assure, insofar as possible, that any variations in the data obtained were those resulting from material characteristics.

All specimens were jig-centered between the electrodes to assure that the welds would be located in the center of the specimen. Forty-five welds were made for each material item to provide sufficient data for tension-shear, direct tension, torsion, tension-impact, and hardness-micrographic studies for the "as welded", 1150° F annealed and the fully annealed conditions except as described in the following section.

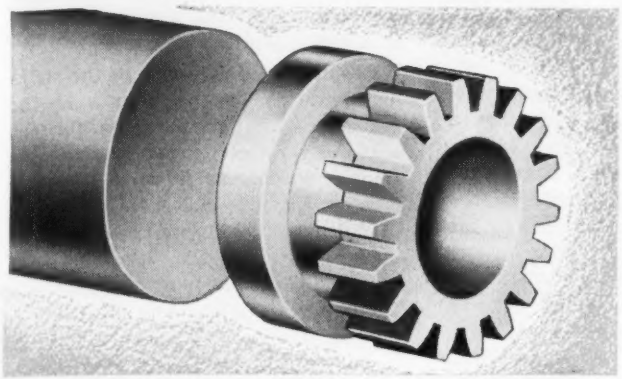
**Test Procedure**—One-third of the prepared specimens were tested "as welded", one-third after an 1150° F anneal and one-third after a full anneal, except that the latter treatment was omitted for thickness over ⅛-inch. The pertinent specimens were treated within a 48 to 96 hour period after welding by heating for 30 minutes at temperature in an atmosphere of Ammogas, to prevent weld edge decarburization, and were then furnace cooled to room temperature.

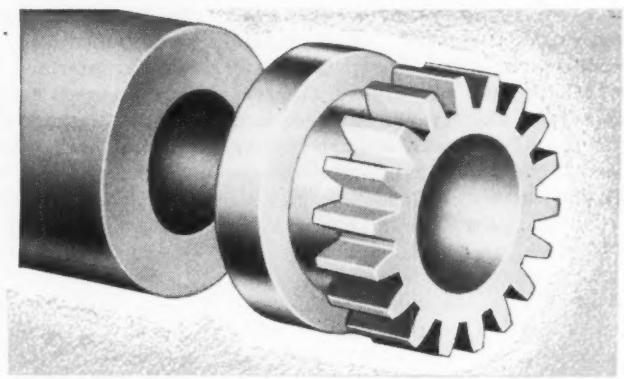
Diamond pyramid hardness surveys (Vickers, 10 kilogram load, 2/3 obj) were made across one polished weld midsection of each material-treatment series. Multiple rows of readings spaced 0.03 inch apart with the indentations spaced 0.25 inch



GIGANTIC HIGH BEND: This 31-foot 3½-inch high bend, largest ever produced by Shaw-Kendall Engineering Co., Toledo, O., is to be used for steam distribution at the University of Illinois power plant. Twelve-inch carbon steel seamless pipe of 0.406-inch wall thickness, was furnished by Spang-Chalfant, shaped by special process which utilized heat on inside of the tube, thereby assuring close temperature control as well as clean, accurate bends

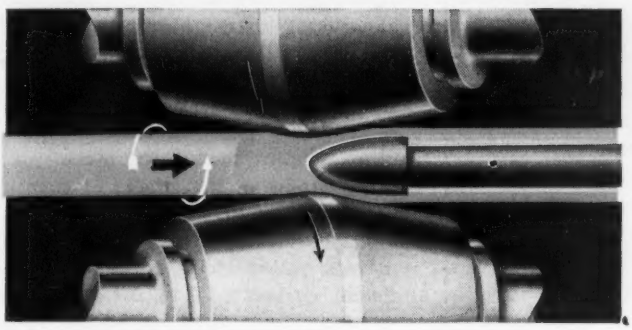
# How to cut costs on cylindrical parts...

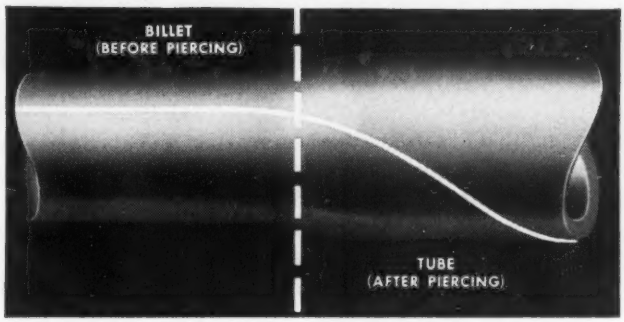




**1 YOU'RE HALF THROUGH** before you start when you make cylindrical parts from Timken seamless tubing instead of bar stock! There's no center hole to drill . . . less stock to machine. With Timken seamless mechanical tubing, boring can either be eliminated completely or is reduced to a rapid finishing operation. Since production is greatly increased you may show a worth while saving in costs . . .

# and get better quality, too!






**2 THE PIERCING OF TIMKEN TUBING** is basically a forging operation. Red hot billets are worked between the rolls and forced over the piercing point with a spiral kneading action that thoroughly works the metal from the inside, from the outside, and throughout the entire cross section. Since the tubing is pierced at the rate of a foot a second, there's no time for heat loss—you get uniform fine forged quality from one end of the tube to the other.

This thorough hot working of the metal gives the tubing a uniform spiral grain flow and a refined grain structure for greater product strength and toughness. Close control of manufacturing—from melt shop through final tube inspection—assures uniform quality from tube to tube and heat to heat . . . uniform response to your machining and heat treating. Let our Technical Staff make an "on-the-job" analysis for you. No obligation. Write Steel and Tube Division, The Timken Roller Bearing Company, Canton 6, Ohio.

**YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH**

**TIMKEN**

TRADE-MARK REG U S. PAT OFF.

***Fine Alloy***

**STEEL**

***and Seamless Tubes***

*Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing.*

apart in the row were taken for the initial studies on sections across cold rolled steel welds. Only one such row, located 0.03-inch from the interface edge was used on the final phases of the work. Micrographic studies were made on representative welds. Special and typical observations were photographically recorded.

Standard American Welding Society tension-shear and cross-type direct-tension tests were made in the regular manner at room temperature (from 70 to 80° F). Ends of the cross specimens were securely bolted to the test jig to assure a fixed end condition for all thicknesses. Ultimate load, weld diameter and type of failure were recorded for each specimen. Examples of failure types are shown in Fig. 1.

Failures were classified as being of the button type (B) when a slug was pulled from one or both parts; of the interface type (D) when failure occurred between the faying surfaces; of the cone type (C) when a partial slug was pulled out of one piece; and of the weld edge type (A) when failure originated at the weld edge and progressed across the test piece. The first three failure types may occur for either the direct-tension or the tension-shear type of loading. The weld edge failure type, as shown in the upper view of Fig. 1, could occur only under the tension-shear loading condition. All physical tests reported were made within a time interval of 48 to 96 hours after completion of the welding or heat treating operations.

**Results Obtained**—One of the striking features of the results is the magnitude of the hardness for the low and very low carbon steels in the thinner specimens. From a consideration of the possible thermal circuits involved in cooling a spot weld it is apparent that the developed heat may be conducted away from the weld nugget in three main parallel, or additive, series circuits.

An idealized thermal diagram is shown in Fig. 4. Radiation into the surrounding atmosphere is neglected. The diagram in Fig. 4 suggests that the periphery of the weld may be a region subjected to a high quench rate under certain circumstances depending upon whether or not sufficient prequench time was available for significant heat flow into the surrounding metal. In all cases the axes of the crystallization pattern of the weld ingot should be parallel to the line of heat flow. This condition exists, as shown in Fig. 5 for a section through a spot weld nugget in one-eighth inch thick steel.

Variations in the effects of quench rates were first studied by making multiple hardness traverses on welds in cold rolled steels containing sufficient carbon (.17 to .25 per cent) to cause pronounced hardening when rapidly quenched; whereas when slowly cooled from either above or slightly below the critical temperature a softened zone would be obtained. This preselection of materials provided a convenient contrast for differentiating between the slowly and rapidly cooled zones.

For ½-inch plate containing 0.22 per cent carbon, the metal surrounding the weld nugget, which was subjected to the heating effect of the applied current for 13 seconds, cooled at a relatively slow rate. A softer circular doughnut shaped ring of heat affected metal surrounds the weld as a consequence of this condition.

For 0.17 per cent carbon steel the maximum hardness for spot welds in 1/16 and 1/32-inch thicknesses approaches but does not quite reach 500 DPH. The difference between maximum hardness of the weld nugget (932 DPH) and of the unaffected preannealed base metal (164) for the 0.82 per cent carbon steel, in Fig. 6, is about as great as can be achieved, and the graph is particularly striking for that reason.

Maximum hardness is unaffected

# Lock Washer Torsion Test

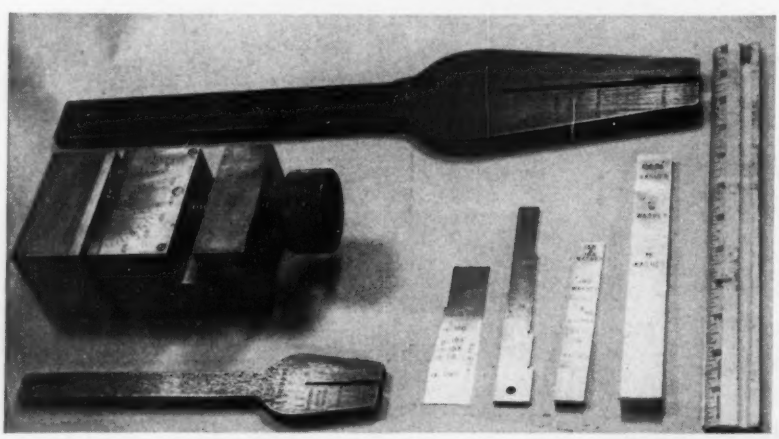
## *Provides Unmistakably Clear Results*

CORRECT and reproducible results for torsion testing of lock washers are available with apparatus developed by Westinghouse Electric Corp., Pittsburgh. Test is not new but is refinement of equipment for conducting accepted torsion test.

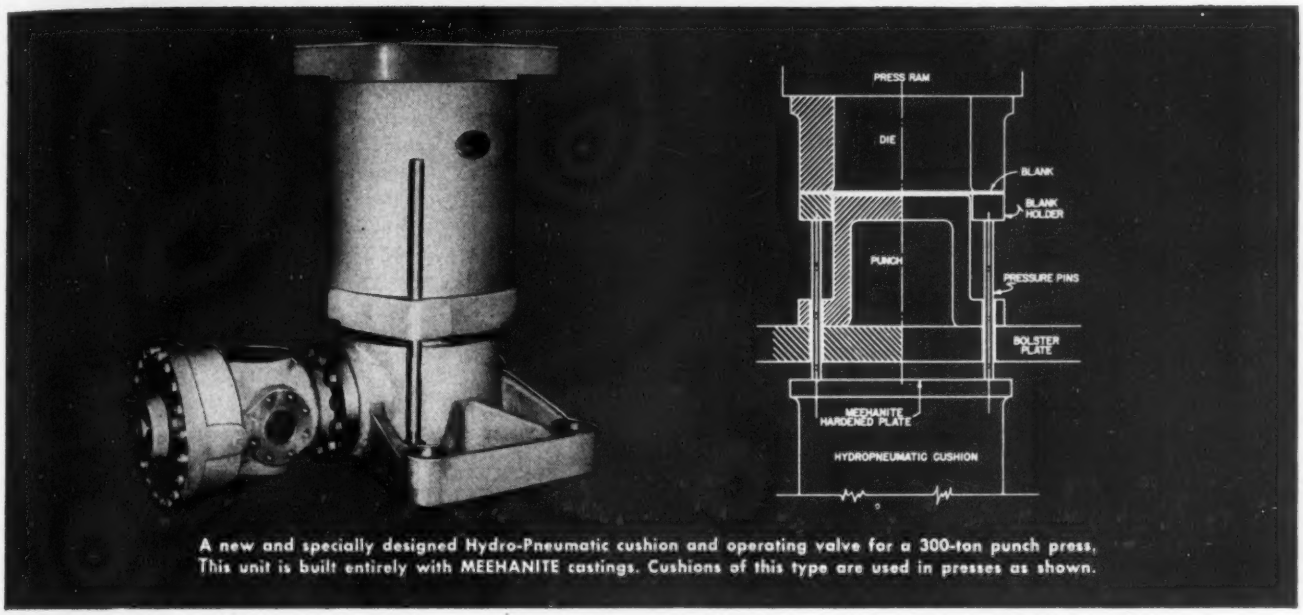
Arguments with suppliers over border line cases using torsion test described in authoritative handbooks showed the following variables: Percentage of washer not included between jaws of vise, exact angle through which washer is twisted before fracturing and grip of monkey wrench on washer. These variables were a sore point when a manufacturer questioned rejection of lockwashers due to failure on torsion test.

Testing apparatus devised as result of above variables is shown in accompanying illustration. Vise is calibrated with protractor scale so that angle of failure can be readily determined. The two gages shown at left are calibrated for different sizes of lockwashers and are placed between jaws of vise so that lockwasher can be placed on appropriate step. Gages on right are placed on level corresponding to diameter of washer leaving exact prescribed circumference of washer free for twisting between vise and wrench.

During last two years this apparatus was used for routine inspection of all lockwashers received at plant and its validity was never questioned by suppliers. In addition equipment is used for torsion testing of lockwashers after electroplating to ensure that washers receive stress relief treatment for hydrogen embrittlement.



# *for those* **EXTRA** *properties design with Meehanite® Castings*




A new and specially designed Hydro-Pneumatic cushion and operating valve for a 300-ton punch press. This unit is built entirely with MEEHANITE castings. Cushions of this type are used in presses as shown.

IN THE DESIGN of new products or redesign of old ones engineering thinking turns to Meehanite castings for *extra* characteristics. A typical example is found in the new and specially designed Hydro-pneumatic Press Cushion illustrated.

For this unit 5 specific characteristics had to be provided in combination. These were:

(1) High Strength
(2) Pressure Tightness
(3) Wear Resistance
(4) Hardenability
(5) Resistance to Erosion.

The cushion which is suspended in the bed of the press (see sketch) exerts an upward thrust on the blankholder in the draw die and gives the same effect as a mechanically operated blankholder in a double action press. It operates at a working pressure of 1000 psi and the 21″ diameter ram delivers thrust pressures up to 170 tons. The press can operate at a speed of 14 strokes per minute.

A Meehanite plate, hardened to about 500 Brinell, is provided to protect the top of the cylinder from the pounding of the pressure pins.

Cylinder, ram and control valve parts are Meehanite castings, the valve and removable valve seat also being heat-treated for hardness to increase erosion resistance to the oil which passes the valve and seat in large volume at high velocity.

Write for our Bulletin No. 10 "Meehanite—the Metal for Pressure Castings."

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| Otis-Fensom Elevator Co., Ltd. | Hamilton, Ontario |

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PERSHING SQUARE BUILDING • NEW ROCHELLE, N. Y.

by prewelding temper and thus for cold rolled or prequenched and tempered steels of the same carbon content the differential beween the unaffected and the maximum hardness would be less than that obtained from the use of preannealed stock.

Curves obtained by plotting peak hardness numbers against material thickness for the different carbon contents are shown in Fig. 3 for all of the compositions tested. The Jominy type curve for each carbon content will be recognized. By means of these curves the thickness-composition conditions under which the critical quench rates were exceeded throughout the thickness of the material, with the welding conditions employed, is fairly clearly defined. The higher carbon steels hardened for a greater depth (thickness) than was the case for the lower carbon steels as expected from known metallurgical data.

From the detail hardness data it is apparent that the weld edge is quenched at the highest rate for most of the common thickness range. Center of the larger nuggets contained the regions of minimum hardness and maximum porosity, indicating that this portion of the ingot solidifies last and cools less rapidly than the edges as the heat abstracting effect of both the surrounding steel and the electrodes becomes less efficient.

An examination of the weld fractures commonly revealed the presence of peripheral cracks, particularly in the medium and higher carbon steel spot welds for the thinner materials. In all cases for the welds described, wherein no in-the-machine heat treatment was employed, the cracks were formed upon cooling and were therefore also expectedly present in the furnace heat treated specimens.

These peripheral weld cracks were within the volumes of most rapidly quenched metal. The cracking is also related to the volumetric changes which occur upon transformation and the superimposed cooling stresses. The elimination of the possibilties for the formation of quench cracks is obviously one of the two major functions of special in-the-machine heat treatments.

*(To be concluded)*

From data presented by the author before the American Welding Society, Chicago, Oct. 22, 1947.

—o—

Welding techniques for aluminum and magnesium base alloys are covered in a report available from Office of Technical Services, Department of Commerce, Washington. Prepared by researchers of Battelle Institute, Columbus, O., the discussion encompasses three major subjects: Properties of aluminum and magnesium and their alloys as related to welding, an analysis of literature relating to welding and allied processes of joining light metals and status of aluminum and magnesium welding as indicated by industrial experience.

# Precision Method of Fabricating

## . . . makes heavy-duty gridded bearings available at lower cost

DISCOVERY of a simple method to precision build gridded bearings at mass-production savings by National Bearing Division, American Brake Shoe Co., St. Louis, recently opened the way to longer life and lower maintenance costs for an additional number of high speed, heavy duty engines and machines. In the past, principle of cutting tiny grids into the bearing shells and filling them with babbitt was slow, tedious and costly work.

Babbitts are known as the best bearing materials within their strength limit since they readily imbed dirt and grit and work well with all common types of shaft material. They will endure insufficient or intermittent lubrication and considerable distortion, but they do not have the strength and fatigue resistance to stand up in many high speed, heavy duty applications.

Various other materials were tried out but these stronger materials require harder shafts, more and cleaner lubricants, better journal surface and greater constructional accuracy. Lead-tin bronze bearings developed shortly before the war have great fatigue strength and are proof against hydraulic pressure, a prime requisite for heavy duty service. Increasing loads, however, require even better bearings, and gridding centrifugally cast lead-tin bronze to combine its advantages with those of babbitt was the next step in development.

The result is an almost ideal combination of good bearing properties. Gridded area provides conformability of a strong bronze bearing plus embedability equal to that of babbitts. It also overcomes objections to using bronze with a shaft that is not hardened because the gridded bearing is self healing.

In periods of great overstress some babbitt melts out of grids and forms a running surface that prevents damage to shaft where ordinary bearings would seize and fall. Further increase in seizure and corrosion resistance is added by means of a 0.002-inch run-in surface of lead-tin electroplated in the bore. Gridded bearings are now operating under loads in excess of 3500 pounds per square inch projected area with shafts as low as 160 brinell hardness.

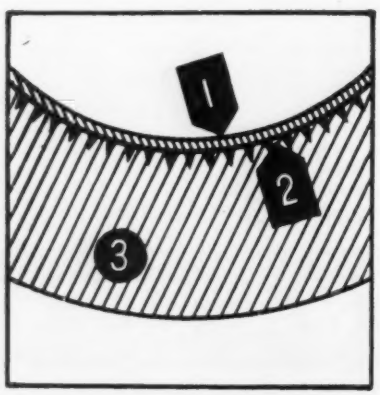



*Fig. 1 (left)—Cross section of gridded bearing showing (1) 0.002-inch lead-tin alloy "run-in" surface; (2) Precision spaced grids filled with silver babbitt; (3) Centrifugally cast lead-bronze shell*

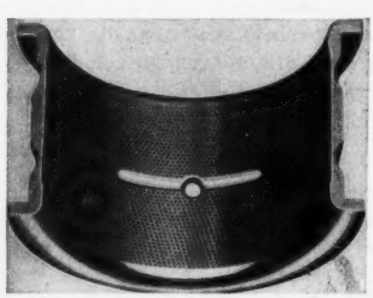


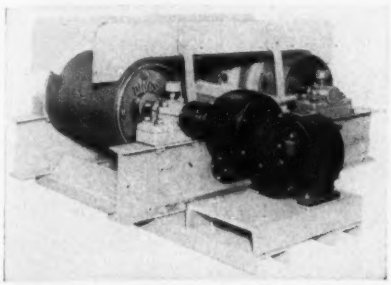
*Fig. 2 (right)—Gridded bearing normally in form of half bushing also can be furnished as full cylindrical bearing*

# New Products and Equipment

*Additional information on the new products and equipment described on this and succeeding pages may be obtained, without obligation, by checking appropriate numbers on the cards following page 142*

## 1. Magnetic Separator

Line of self contained horizontal and inclined magnetic pulley type separators incorporating an alnico magnetic Perma-Pulley, idler pulley, endless belt and drive is announced by Dings Magnetic Separator Co., 4740 West McGeogh Ave., Milwaukee 14, Wis. Units are designed to provide



automatic removal of tramp iron from such materials as coal, ore, plastics, chemicals, rock, cement, etc.

They are intended for installation at the discharge of chutes, hoppers and conveyor belts, or they can be fed by hand or by various materials handling devices. Standard models are available with belts of any length in widths ranging from 12 to 60 inches. Perma-Pulley diameters range from 12 to 30 inches standard.

## 2. Tilting Fork Trucks

Light weight, low capacity electric tilting fork trucks of 1000, 1500 and 2000-pound capacities are being made by Yale & Towne Mfg. Co., 4530 Tacony St., Philadelphia 24, Pa. For transporting and tiering operations, the trucks are compact and have small dimensions (58 inches long and 38 inches wide).

Their light weight makes them desirable when elevator capacities or weak floors or bridges must be traveled. All have four forward and four reverse speeds, spur gear drive, sit-down control and a fork lifting height of 127 inches, with an 83-inch overall truck height.

## 3. Welding Machine

Power demands for annular projection welds are minimized with a welding machine designed by Taylor-Winfield Corp., Warren, O. The machine rated at 150 kilovolt amperes, delivers 58,000 amperes at a power factor of 61 per cent while projection welding electrical terminals to refrigerator motor housing cases. High electrical efficiency with low power demand is attained through a divided secondary with a very low impedence. Frame design minimizes deflection and assures equalized welding force over weld area.

Machine may be obtained with a stationary lower electrode holder or

a rocking electrode holder which facilitates loading and unloading. Upper electrode is raised and lowered by an air cylinder through insulated heavy duty guide bearings.

## 4. Enclosed Motors

Recently redesigned by Burke Electric Co., Erie, Pa., is a line of 2 pole, totally enclosed, fan cooled, squirrel cage motors from 250 to 500 horsepower. Especially designed for direct drive of high speed blowers, pumps, compressors and similar equipment in locations involving excessive moisture conditions or dusts of an abrasive or conducting nature, the motors have normal starting torque, low starting current and are suitable for full voltage starting. They are rated for a 55°C rise in continuous operation, and are available for 2 or 3 phase, 60 cycle, 400, 550, or 2300 volt operation.

Windings are completely enclosed and bearing brackets and external fans are enclosed within an outer end shield which directs flow of cooling air over bearings and up through radiators within outer shell, discharging it at center opening. Split bearing brackets and split sleeve bearings are used to facilitate removal for inspection or overhauling.

## 5. Quick Change Spindle

A means of both seating and ejecting shank type cutters, arbors and adaptors is available with the quick change horizontal boring machine spindle, developed by Giddings & Lewis Machine Tool Co., Fond du Lac, Wis. It is provided with a steep or fast taper socket and a simple built-in double acting screw locking device. This improvement enables the operator to rapidly mount cutting tools by inserting the shank into the spindle opening or socket.

Seating or drawing in the shank is accomplished by tightening the

lock's single screw which has both right and left hand threads. To eject the tool, the lock screw is turned in the opposite direction. As no portion of the locking device extends beyond the surface of the spindle, it can be fully retracted into the headstock. The spindle may be specified on all new horizontal boring, drilling and milling machines made by the company, or for machines now in use.

## 6. Elevating Conveyor

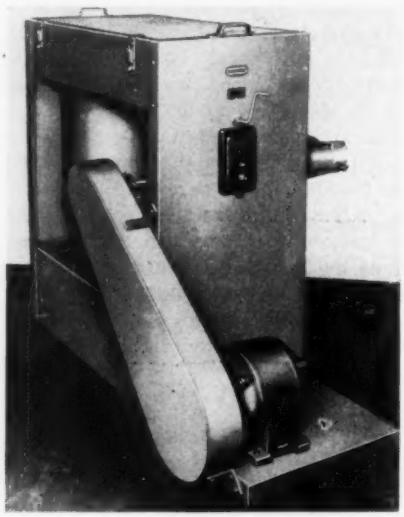
Parts or packages may be sent from floor to floor with a vertical conveyor recently announced by Steel Parts Mfg. Co., 222 S. Morgan St., Chicago 7, Ill. Recommended load limit is 50 pounds per arm, but it can be exceeded by 50 per cent. Pulling load limit on conveyor which can carry parts up or down is 1000 pounds.

Belt links are made of 18 gage steel and have a 6 inch pitch. Two rollers

are attached on each side of belt and are guided in channels. Length of conveyor may be from 5 to 30 feet and available widths run from 12 to 30 inches. Conveyor can be driven up to a maximum speed of 50 feet per minute with motor requirements varying from 1/2 to 2 horsepower depending on individual installations.

## 7. Dust Collector

Incorporating a special motor mounting for an overdrive so that the normal fan speed will be maintained on 25 cycle power, the new model 11D50 Dustkop dust collector, made by Aget-Detroit Co., Main at Washington Sts., Ann Arbor, Mich.,



permits development of 1300 cubic feet per minute suction on a 6-inch diameter inlet. Unit may be used on large wheeled buffers, polishers, grinders, belt sanders, etc.

Dust removed by suction at the hood first passes through a cyclone separator which removes a large percentage of all dusts and deposits it in a drawer. The partially cleaned air then receives a second stage cleaning by spun glass filter. Cleaned air returns to working space, saving considerable heat.

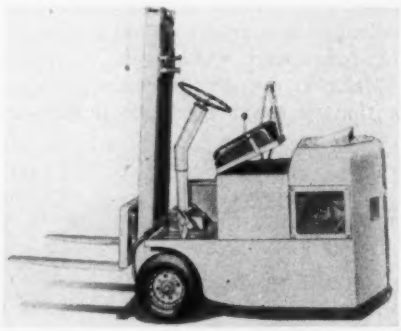
## 8. Belt Conveyor

Discontinuance of sale of former models and replacement with a unitized conveyor table is announced by Island Equipment Corp., 101 Park Ave., New York 17, N. Y. This belt conveyor has a rigid standardization of parts which are absolutely interchangeable eliminating drilling and fitting. Unit may be made as long as needed by coupling together two or more tables which are made in different lengths and 11 widths.

Operators can work on one or both sides of the table which can be used as a work table, for assembling, inspecting and conveying.

## 9. Fork Truck

A 2000 pound capacity fork lift truck, the Thrifty Lift, is an addition to the Chore Boy line of Buda Co., Harvey, Ill. Available with lifts of 7, 8 or 9 feet, the truck is powered by a twin

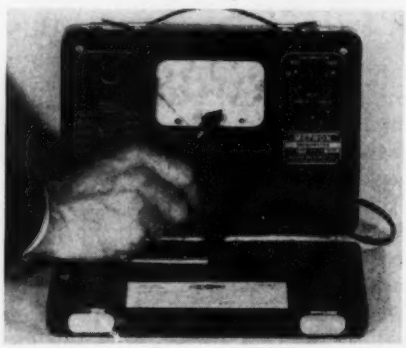


cylinder Onan gasoline engine, a 4-cycle air cooled model of 10 horsepower.

Lift and tilt mechanism is completely hydraulic and rubber cushion 4 x 16-inch tires are standard equipment. Truck may be shifted from forward to reverse without the operator touching the gear shift lever. Outside turning radius is 59 inches. Other dimensions are: Length (less forks), 63-3/8 inches; with, 32 inches; wheelbase, 33 inches.

## 10. Tachometers

Tachometers of continuous operating type and accurate to 1/4 per cent of speed being measured are announced by Metron Instrument Co.,

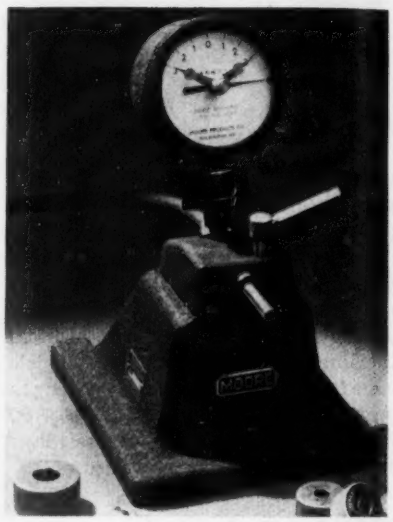


432 Lincoln St., Denver 9, Colo. Type 48H is for speeds from 900 to 10,000 revolutions per minute, and type 48J is for speeds from 90 to 1000 revolutions per minute. Each tachometer has ten overlapping ranges which can be selected by a rotary switch. No damage is incurred by accidental selection of wrong range.

Only one permanently lubricated rotating part is used in each tachometer head. The tachometers also employ an electrical bridge circuit principle and are self calibrating.

## 11. Air Gage

Type C comparator gage announced by Moore Products Co., Philadelphia 24, Pa., includes interchangeable calibrated dials with 3-1/4 inches of pointer travel for a full scale indication of 0.0004 inch at highest amplification and 0.002 inch at lowest amplification. Pneumatic gaging plugs, rings and special members are interchangeable. Gaging members are



furnished either with thread mounting or with cam-lock type mounting which permits rotation of plug to distribute wear over surface.

Flow of air is controlled at a constant value, regardless of gaging pressure, with the company's adjustable compensator. As a result, the gage provides for diametral wear in pneumatic member of 0.0004 to 0.006 inch depending upon amplification for which member was designed.

## 12. Spindle Grinder

Redesign of their vertical spindle grinder is announced by Standard Electrical Tool Co., 2504 River Rd., Cincinnati 4, O. Thrust bearing construction includes a threaded nut and screw to externally take up wear on bearings without removing wheel or any parts.

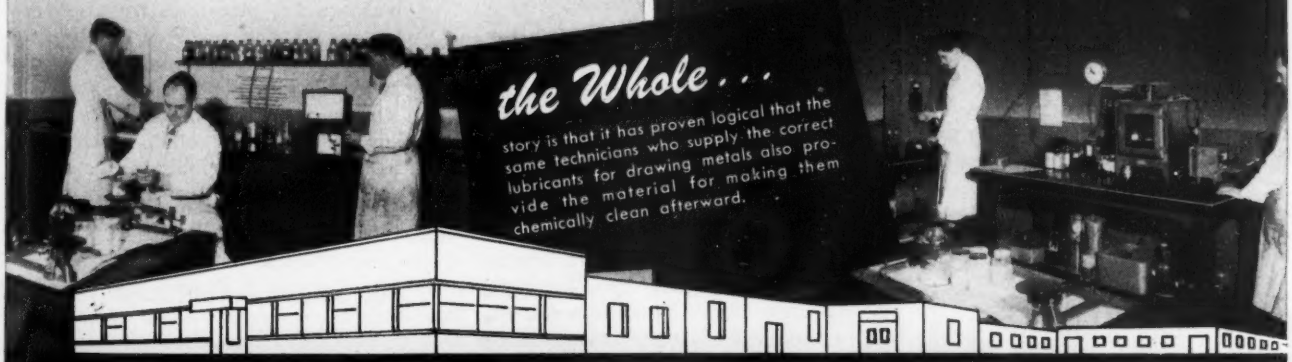
Grinder is equipped with precision ball bearings and is made in sizes from 1/2 to 15 horsepower with individual speeds of 1150, 1750 and 3450 revolutions per minute. It may be used with a straight wheel for periphery grind-

*(For more information, use the card following page 142.)*

# HALF + *the other* HALF

of this advertisement is concerned with "SUPERDRAW" metal forming lubricants developed for ferrous and non-ferrous metals in both pigmented and non-pigmented form . . . "SUPERDRAW" products are specifically compounded for 1. Brass and Brass Alloys, 2. Cold Rolled Steel, Enameling Iron, Stainless Steel and Aluminum, 3. Alloys of Steel, Aluminum and Copper . . . "SUPERDRAW" compounds will handle light, medium, and heavy operations . . . may be applied by brush, roller, spray, or dipping.

of our activity concerns NORTHWEST products and processes for chemically cleaning ferrous and non-ferrous metals preparatory to plating, vitreous enameling, painting, etc., each problem involving a specific programing of one or more of the thirty-five standard NORTHWEST Cleaning Compounds including Electrolytic, Immersion, Solvent, Spray, and Water-Wash types . . . *A request on your letterhead will bring a technician to consult you on your drawing and cleaning problems . . .*



*the Whole . . .*

story is that it has proven logical that the same technicians who supply the correct lubricants for drawing metals also provide the material for making them chemically clean afterward.

**NORTHWEST CHEMICAL CO.**

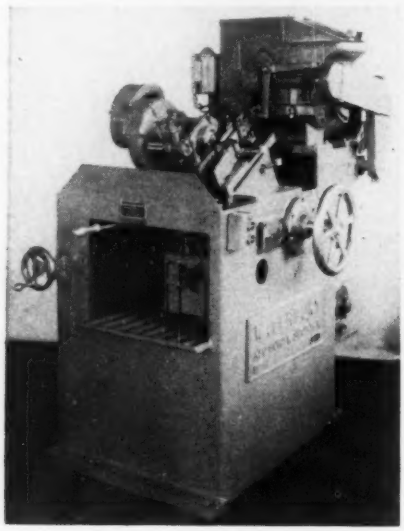
9310 ROSELAWN AVE. DETROIT 4, MICH.

. . . serving you since '32

ing, with a cup wheel or may be constructed to accommodate a plate mounted cylinder type of cup wheel. Grinder may be applied to planer, boring mill, surface grinder or milling machine and is available without feed, with vertical or horizontal feed or with both feeds.

## 13. Screw Slotters

Screw slotters with capacities from No. 2 to 1/2 inch diameter machine screw sizes inclusive are being manufactured in four standard sizes by Waterbury Farrel Foundry & Machine Co., Waterbury 86, Conn. Model 0 has a production rate from 40 to 125 screws per minute and Model 1 has a production rate from 20 to 80 screws



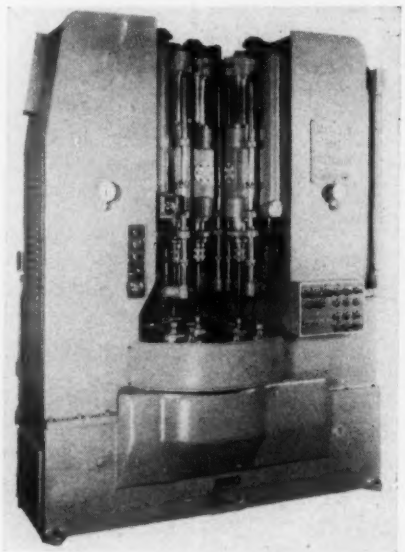
per minute. These machines have an improved hopper feed, twin-cutter burr remover and many variable production speeds.

Saw arbor is chain-driven through change gears and is installed in a frame which may be swung up to a vertical position in changing saws. Three change gears are included with each machine as standard equipment, but additional gears may be obtained to provide 17 different speeds. Depth of slot and feed stroke are regulated by means of two hand knobs.

## 14. Heavy Duty Machine

Heavy duty, multiple spindle, unit constructed Hydrohoners manufactured by Micromatic Hone Corp., Detroit, Mich., rapidly remove stock from hard materials and hold close tolerances. Each spindle is mounted in a quill and is actuated as an independent unit. This design reduces weight reciprocated to a minimum and eliminates necessity of guide bars. Torque and thrust are taken along center line of spindle.

Expansion of tools and reciprocation of quills are powered and controlled hydraulically. Feed-out is positive and pressure applied in each



tool may be adjusted independently. Columns are spaced about a common base and indexing table. By interlocking hydraulic control panels, automatic indexing table and automatic sizing devices, operation is made entirely automatic.

## 15. Metallizing Gun

A large compressor is unnecessary with the new light duty, low air metallizing gun announced by Metallizing Engineering Co. Inc., Long Island City, N. Y. Turbine construction and a new nozzle assure lower cost per pound of metal sprayed because of low consumption of acetylene and oxygen.

Turbine control requires only one adjustment for the entire range of metallizing wires. Gun weighs 4 pounds 2 ounces and will spray all kinds of metal at low installation cost.

## 16. Squirrel Cage Motor

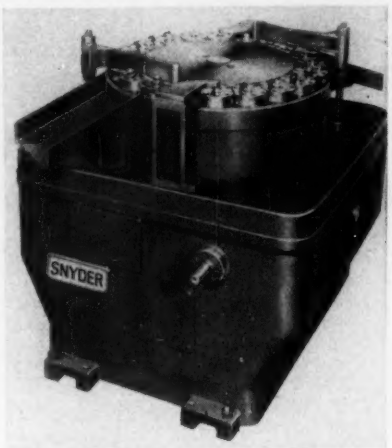
Newly designed by Westinghouse Electric Corp., Pittsburgh 30, Pa., is a single-phase, squirrel cage motor in ratings of 3/4, 1, 1-1/2, 2, 5 and 7-1/2 horsepower. The type CAP motor utilizes a capacitor for starting only. After motor approaches full speed, starting switch disconnects the capacitor and it operates as an induction run motor. Self sealed prelubricated ball bearings provide effective lubrication for five years or longer without repacking.

Motors are made for 60, 50 and 25 cycle, single phase, 110/220 volts dual voltage and 110 or 220 volts single voltage. Available motor speeds are: 3450, 1750, 1160 revolutions per minute for 60 cycles; 2875, 1475, 970 revolutions per minute for 50 cycles; and 1450 revolutions per minute for 25 cycles.

## 17. Special Assembler

Assembling the packing washer onto groove in hydraulic brake pistons at rate of 50 assemblies a minute can be accomplished with a special purpose machine produced by Snyder Tool & Engineering Co., Detroit, Mich. A continuously revolving variable speed table is driven through a spur and worm gear transmission with a 2-horsepower motor. Rotation speed can be changed by means of pickoff change gears.

Brake pistons are loaded into twenty automatically operated collet fix-

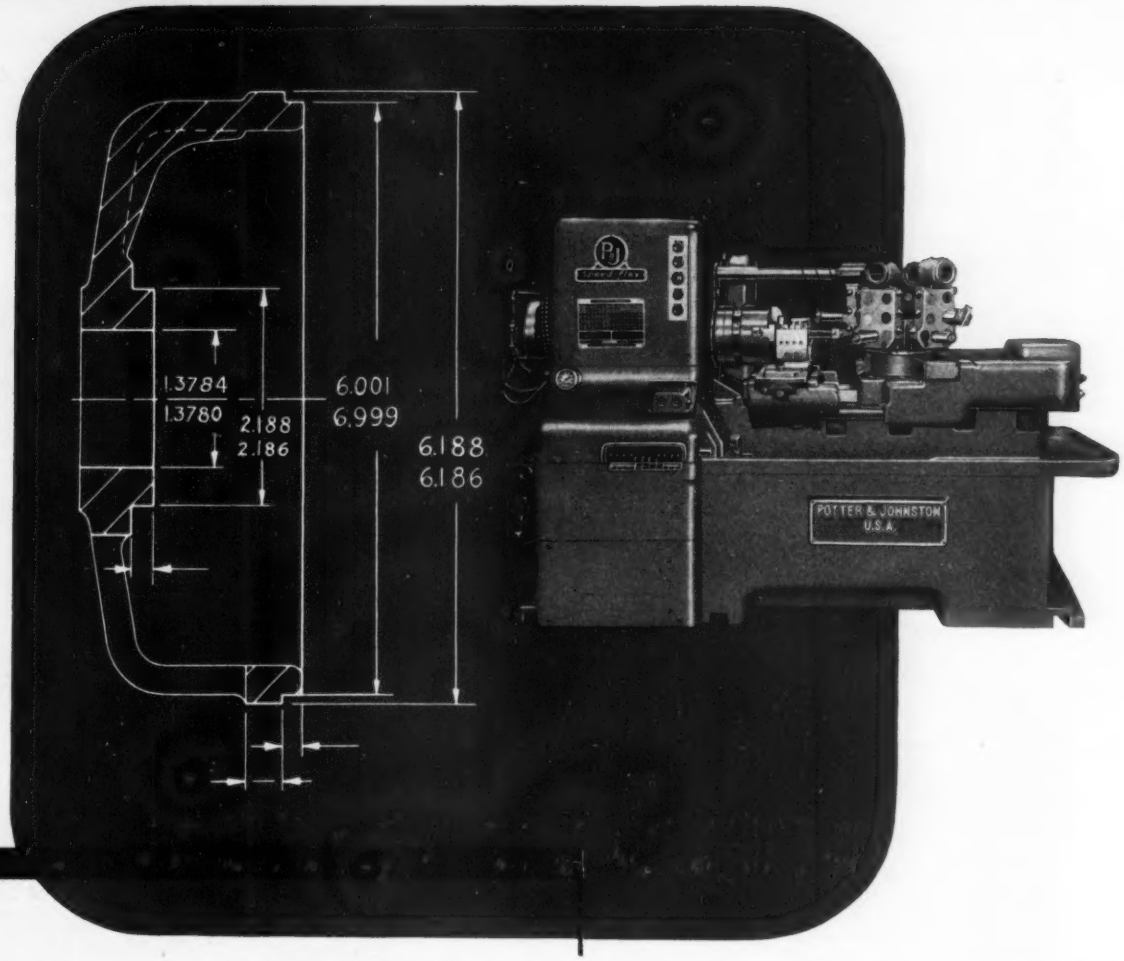



tures mounted on table and packing washers are placed in front of each piston. As table revolves, collets automatically close, clamping piston and a spreader finger forces washer into place on piston. As assembly leaves spreader finger, collets open automatically and assembly is ejected into discharge chute. Entire machine occupies floor space of 45 inches square.

## 18. Solenoid Contactor

Compact construction, complete accessibility of parts, solderless connectors, massive double break silver contacts and long trouble-free operating life are features of the size 2 bulletin 4452 and size 3 bulletin 4453 alternating current solenoid contactors made by Ward Leonard Electric Co., Mount Vernon, N. Y. Intended for use in alternating current motor controllers, they are also suitable for

*(For more information, use the card following page 142.)*




**OTOR END SHIELD COSTS ARE SLASHED BY THE NEW POTTER & JOHNSTON -U SPEED-FLEX AUTOMATIC TURRET LATHE, PLUS P & J TOOL ENGINEERING**

***ke a look at this record:***

**ALLOWANCE FOR CHUCKING . . . . only 12 seconds**
**TO INDEX THE TURRET . . . . . only 18 "**
**ACTUAL CUTTING TIME . . . . . only 93.6 "**

**Which adds up to 2 minutes 3.6 seconds "Floor-to-Floor" time per piece, or 24.77 pieces in a "51 minute hour!"**

Now picture your work on this machine! Same size and type of Automatic ich day in and day out is giving this splendid performance on 6.187 inch diam- cast iron motor end shields, will do equally profitable work for you on a e variety of parts.

ear in mind that Potter & Johnston's new 3-U Speed-Flex weighs only 5000 nds and occupies only 16 square feet of your valuable floor space. Bear in d that its standard range of spindle speeds, from 73 to 1445 revolutions per ute (with 36 to 711 optional) gives full scope both to high speed steel and ide cutting tools, both on ferrous and nonferrous materials. Bear in mind duration of non-productive phases in the automatic cycle have been reduced west terms by electro-pneumatic control and split-second timing. Bear in d that operating convenience of P & J 3-U machines attracts and holds ces of the best operators.

xperienced P & J tool engineers will tell you the economic and production in terms of your own tough jobs—if you will send blueprints, or sample parts, specified limits.

# POTTER & JOHNSTON

## MACHINE CO., PAWTUCKET, R. I.

**Binks** a single source for

**Everything you need for better spray finishing**

If you want spray finishing equipment that fits your particular requirements precisely you will find it in the Binks line. Here is *everything* you require, regardless of the size of your operation, the finish you are using, or the speed of your production. Here is precision equipment, designed to give you longer service, finer finishes and greater economy, plus a national engineering and service organization.

AND THESE ARE ONLY A FEW OF BINKS STANDARD ITEMS

**36 STANDARD SPRAY GUNS**
ranging from small touch-up guns to master production guns such as the new Model 18.

**1050 NOZZLE COMBINATIONS**
— a setup for every type of material and job, from ceramics to house paint, lacquers, asphaltum.

**7 OIL & WATER EXTRACTORS**
ranging in size from small one-gun models to the Model E75 which handles 75 cu. ft. of air per min.

**83 STANDARD MATERIAL TANKS**
from 2-gallon to 60-gallon tanks with automatic agitators. Also Herculoid tanks for ceramics.

**24 STANDARD COMPRESSORS**
a complete range from compact ¼ HP portable outfits to powerful 10 HP models for heavy use.

**510 STANDARD SPRAY BOOTHS**
from 3'-6" dry bench types to huge Dynaprecipitor Units which thoroughly wash exhaust air.

**12 TYPES OF HOSE**
for air and material, ranging from small ¼" sizes to heavy duty ¾" hose for production use.

"...the right equipment for every job, the best in customer service and fair prices.. these must be our company creed."

J. J. Roche
President

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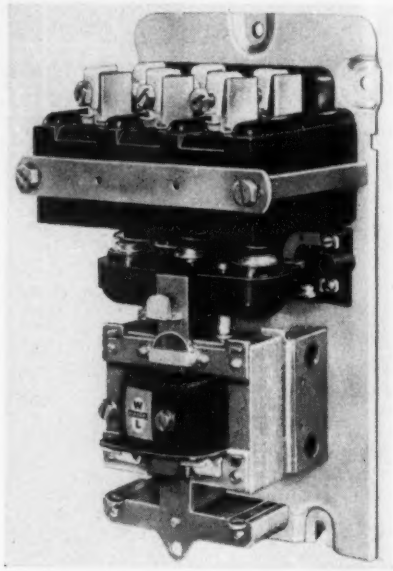
**Binks** **MANUFACTURING COMPANY**
3134-40 Carroll Ave., Chicago 12, Illinois
New York Detroit Los Angeles Atlanta Cleveland
Dallas Milwaukee Nashville Philadelphia Pittsburgh
St. Louis San Francisco Seattle Windsor, Ontario, Canada


use in resistive heat controls, lighting controls, etc. for remote and automatic load switching purposes.

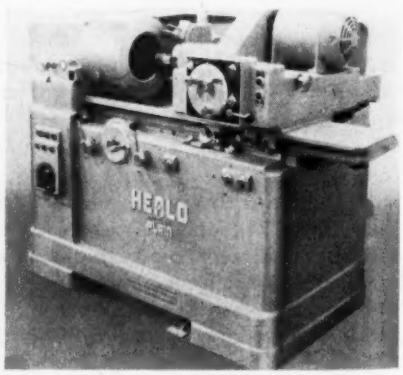
All parts are mounted on a steel plate with recommended NEMA and MTBA standard mounting dimensions. Size 2 and 3 units have maxi-



mum ratings of 25 and 50 horsepower respectively on 440-550 volts, 3 phase, 60 cycles. Standard operating coils with front connected terminals are available for 110, 220, 440 and 550 volt operation on 25, 50 or 60 cycles.

## 19. Internal Grinder

Added to the line of grinders made by Heald Machine Co., Worcester 6, Mass., is the model 271 plain internal grinding machine for small medium lot production where an automatic cycle is not required. All elements




of the grinding cycle can be rapidly and accurately set for rate and amount on the centralized control panel of the wheelhead cross slide.

All levers and knobs of the machine are clearly marked to show their function. Motor and pump units are isolated from the machine base. Other features include automatic lu-

# SECURITY QUIZ

## for MANAGEMENT MEN

## can you answer these important questions?

*How many of your employees are buying U. S. Security Bonds regularly via the Payroll Savings Plan?* (35% to 50% of employees buy Security Bonds on the Payroll Savings Plan in those companies in which top management backs the Plan.)

• *How does their average holding compare with the national average?* (The national average among P.S.P. participants is $1200 per family.)

• *Why is it vital—to you, your company, and your country—that you personally get behind the Payroll Savings Plan this month?* You and your business have an important stake in wise management of the public debt. Bankers, economists, and industrialists agree that business and the public will derive maximum security from distribution of the debt as widely as possible.

Every Security Bond dollar that is built up in the Treasury is used to retire a dollar of the national debt that is potentially inflationary. Moreover, every Security Bond held by anyone means fewer dollars go to market to bid up prices on scarce goods.

• *Can't your employees buy Bonds at banks?* Banks don't provide Security Bonds on the "installment plan"—which is the way most workers prefer to obtain them. Such workers want and need Payroll Savings.

• *What direct benefits are there for your company?* In 19,000 industrial concerns operating Payroll Savings, employees are more contented. Worker production has increased, absenteeism has decreased—even accidents have been fewer!

All these benefits accrue *in addition* to extra security for the individual who gets and holds Bonds. (Every $3 invested pay $4 at maturity.)

But even a plan with all these benefits requires the sponsorship of top management for real success.

• *What do you have to do?* The Treasury has prepared a kit of material especially for you to distribute among certain key men in your company. This will be your part in the all-out campaign—starting April 15—for *America's economic security.*

Make sure you get your kit. Be sure to give it your personal attention. Keep the Payroll Savings Plan operating at its full potential in your company. It's a major factor in America's security—*your best business security!*

For any help you want, call on your Treasury Department's State Director, Savings Bonds Division.

*The Treasury Department acknowledges with appreciation the publication of this message by*

**STEEL**

***This is an official U.S. Treasury Advertisement prepared under auspices of the Treasury Department and the Advertising Council***

Here's Why You Can Save Money on Horsburgh & Scott Helical Speed Reducers . . .

1. Lower cost in manufacture and assembly by engineered simplicity of design.

2. Savings in maintenance and freedom from breakdowns through rugged construction from the finest materials and precision manufacture.

These features are your guarantee of better built speed reducers that last longer.

*Send note on Company Letterhead for Speed Reducer Catalog 46*

THE HORSBURGH & SCOTT CO.

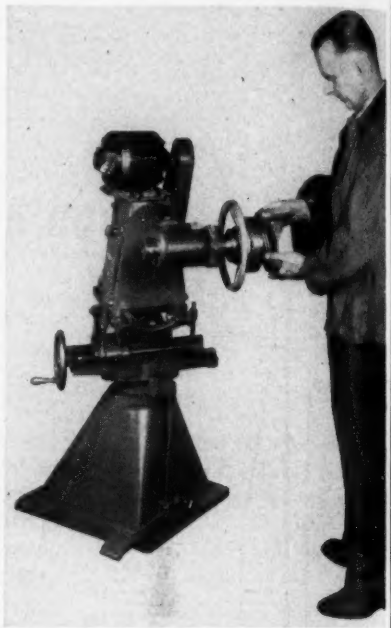
GEARS AND SPEED REDUCERS

5112 HAMILTON AVENUE · CLEVELAND 14, OHIO, U. S. A.

brication, rugged workhead construction and hydraulic refinements providing for constant feed and speeds.

## 20. Polishing Machine

Articles of nearly every shape and size may be handled by the new electrically powered buffing and polishing machine announced by Vanott Machine Corp., 230 Colgate Ave., Buffalo 20, N. Y. Designated as type V-1, the machine is widely adaptable



because it is fully adjustable for heights, angle spindle speed and stroke (up to 6 inches).

Chucks, or holding devices, of all machines are individually designed to hold the item being buffed or polished. All vital mechanism is enclosed for protection from abrasive wear. A foot pedal revolves the head, allowing operator use of both hands.

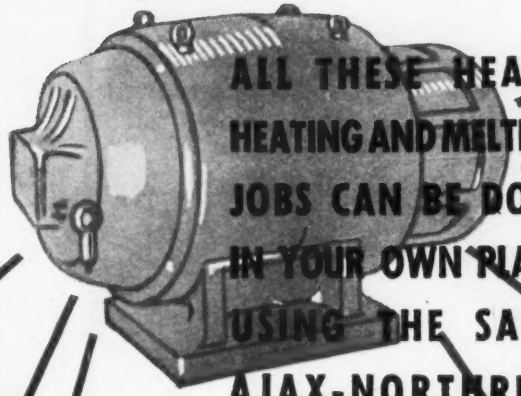
## 21. Carbon Arc Torch

Extension of welding equipment to jobs where application of heat is desired without melting metal is possible with a lightweight carbon arc torch designed for use with alternating current welding machines by Lincoln Electric Co., Cleveland 1, O. Arc torch produces a high temperature flame between two copper-coated carbon electrodes clamped in aluminum alloy jaws. Both carbons are adjustable and geared to move together so that angle of carbons can be kept constant. Torch handle is provided with thumb control tabs for adjusting distance between carbons.

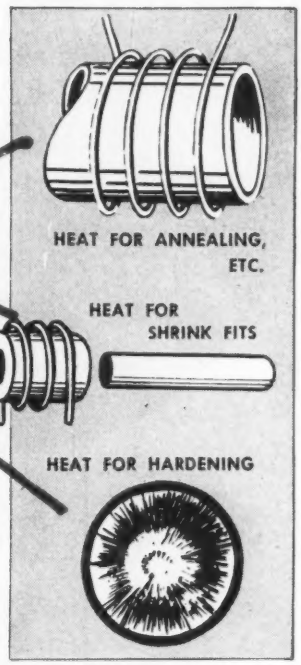
Carbon holder jaws will hold either a 5/16 or 3/8-inch diameter carbon

# AJAX-NORTHRUP HEAT IS *Versatile*

HEATING SLUGS CONTINUOUSLY



**ALL THESE HEAVY HEATING AND MELTING JOBS CAN BE DONE IN YOUR OWN PLANT USING THE SAME AJAX-NORTHRUP EQUIPMENT**

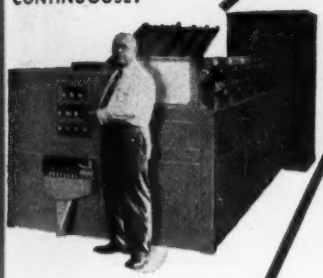


HEAT FOR ANNEALING, ETC.

HEAT FOR SHRINK FITS

HEAT FOR HARDENING

HEATING BARS CONTINUOUSLY



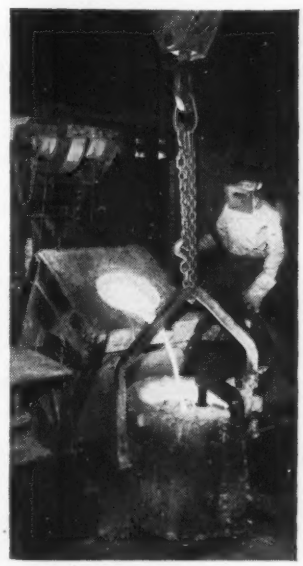
HEAT FOR UPSETTING, ETC.

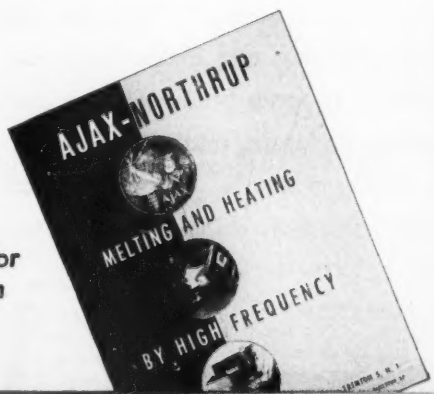
HEAT FOR SPINNING

Ajax-Northrup induction heating equipment is never obsolete. A unit that cuts costs, reduces rejects, lengthens die life, and improves working conditions on your forging operations today can easily be converted to other jobs later. New, efficient work stations or furnaces can be added at only a fraction of the original investment. Sometimes a change of taps is all that's necessary.

**SMALL JOBS, TOO** — Time-tested equipment is available in sizes from 3 to 1200 kw. and up, with frequencies from 25 to a million or more cycles, each installation versatile within a wide range. Ask for our recommendations on your heating and melting.

HEAT FOR MELTING






*Send for Bulletin 27*

96

AJAX NORTHRUP SINCE 1916

**AJAX ELECTROTHERMIC CORP.**

AJAX PARK, TRENTON 5, N. J.

ASSOCIATE COMPANIES

AJAX METAL COMPANY • AJAX ELECTRIC CO., INC.

AJAX ELECTRIC FURNACE CORP. • AJAX ENGINEERING CORP.

**HIGH-FREQUENCY HEATING-MELTING**

INCREASE YOUR CUTTING BETTER THAN 30%

with MILFORD WAVY SET BAND SAW BLADES

YOUR OWN MACHINES ARE YOUR BEST PROVING GROUND

TEST A MILFORD WAVY SET BLADE against the field!

Yes . . . it's true . . . enthusiastic users tell us that 30% increased production on horizontal and vertical cut-off band saw machines *is conservative.*

These blades of unique design eliminate ripping of teeth . . . and cut with greater precision and closer tolerance. One pitch, 10-tooth blades can be used for cutting bar stock, angles and pipe.

Available in the ¾" 10 and 12-tooth sizes for immediate shipment.

*Now individually packed in cartons for ease in handling*

Your Industrial Supply Distributors are always ready to serve your needs for all factory and mill supplies as well as MILFORD WAVY-SET and other blades. Order through them.

MILFORD PROFILE AND BAND SAW BLADES RESISTOR AND DUPLEX HACK SAW BLADES

THE HENRY G. THOMPSON & SON CO.

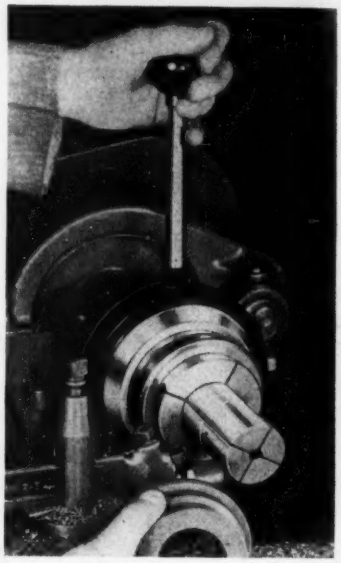
*Saw Specialists Exclusively for Over 70 Years*

NEW HAVEN 5, CONNECTICUT, U. S. A.

without adapters or special jaws. With an alternating current welder the arc torch can be used for brazing and soldering work, general heating and surface hardening of thin materials.

## 22. Expanding Arbor

Expanding arbors for internal gripping for jobs from 5/16 to 4-5/8 inches in diameter, developed by Porst Bros. Mfg. Co., 259 N. California Ave., Chicago 12, Ill., maintain a predetermined pressure and assure a solid grip for steel under heavy cuts



and a gentle grasp for thin tubing and plastics by means of a knurled hand operated selective collet adjustment ring. Steel arbors are made in four steps or sizes of average length and are machined to required size on the machine on which the job is to be run.

Chuck and arbor unit lends itself to many applications including cylindrical grinding, milling, drilling and surface grinding. Chuck is mounted on lathe spindle nose and with aid of hand operated shifting lever operates without stopping spindle and without heating. It provides minimum overhang and runout and insures parallel grip on work.

## 23. Lightweight Lift

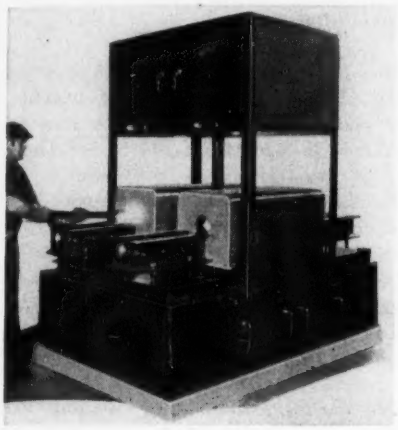
Loads up to 250 pounds can be handled at speed of 40 feet per minute with Zip-Lift crane developed by Harnishfeger Corp., Milwaukee, Wis. Smooth hoisting service is provided by using a wire rope. Other features of the lift are push button control, crane type limit switch and double brakes.

Line voltage at push button is held down to 110 volts where necessary by

means of a transformer. Accurate positioning, instant halting and indefinite holding are other properties found in the lift.

## 24. Induction Heater

Rapid reheating of forge bars that cool too much during preliminary operations can be accomplished with an induction heater located right at the forging machine. Ajax Electrothermic Corp., Trenton 5, N. J., announces an induction heater that turns out one reheated bar every 60



seconds. Bars that drop to 2000 to 2100°F and are too cold for good forging operations are fed on rollers to the high frequency induction furnace where they are reheated on an automatically timed heating cycle and emerge at the exact forging temperature desired.

Heating unit is sized for 4 inch bars and has twin heating coils each of which draws 125 kilowatts of 960 cycle power. Power source is a 700 kilowatt, 960 cycle, 400 volt motor generator unit. One motor generator supplies power for two twin heaters or four work stations.

## 25. Speed-Ratio Tachometer

Accurate control in processes wherein materials are subject to change due to differences in rate of travel is provided with a speed-ratio tachometer announced by Weston Electrical Instrument Corp., 617 Frelinghuysen Ave., Newark 5, N. J. It includes a special speed-ratio indicating instrument which operates in conjunction with two small direct current generators to convert mechanical rotation into measurable quantities.

Generators are connected to input and output drives of machine and wired to indicator, which is calibrated in terms desired such as per cent stretch, shrinkage or elongation. Cali-


ONE OF MANY *Hundreds* OF USES FOR . . .

ZINC-COATED

ThomaStrip

Electro-coated Zinc, Copper, Nickel and Brass . . . Hot Dipped Tin and Solder . . . Lacquer Coated in Colors . . . Uncoated Precision Strip . . . Carbon and Alloy Specialties.

The same qualities of pre-coated ThomaStrip necessary for brushes, enhance many household and industrial products . . . rust-resistance, ductility, gauge accuracy, uniform grain structure, and a coating which will not chip, peel or crack.

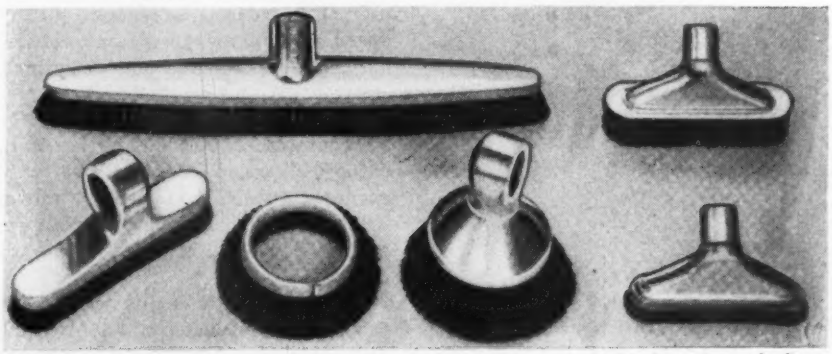
The myriad of products made from ThomaStrip prove the material's versatility and economy. You have a choice of many finishes, coatings, special tempers and analyses . . . in electro-coated zinc, copper, nickel, brass; hot dipped tin and solder, or lacquer coated in colors.

ThomaStrip

REG. U. S. PAT. OFF.

THE THOMAS STEEL CO. • WARREN, OHIO

COLD ROLLED STRIP STEEL SPECIALISTS

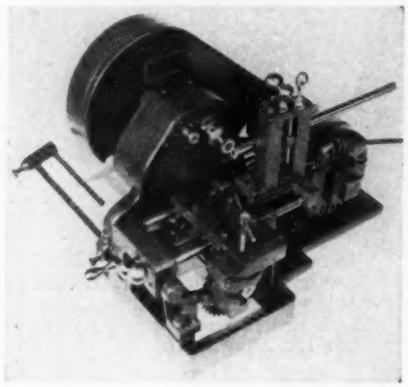


Backbone of these brushes for industrial and household use, is the binder strip made from zinc-coated ThomaStrip. To withstand bending, coiling and forming, the strip has to be ductile, accurate in gauge, and have a coating which will not crack, chip or peel.

bration in production terms such as yards per minute is also possible. Typical use of this meter is to find per cent elongation of metals in various rolling processes.

## 26. Milling Machine

Useful on short run, high speed jobs, a small combination milling machine developed by Hyland Machine Co., 40 Potomac St., Dayton 1, O., provides two speeds for cutting off mild steel, brass, high carbon or alloy steels of any length. It handles

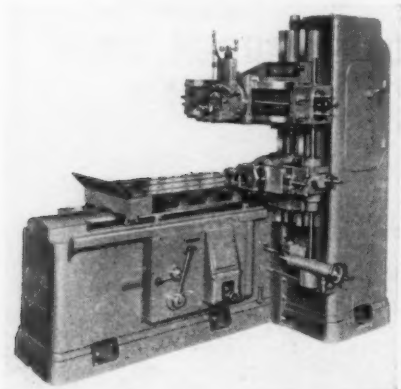


bar stock up to 1-inch diameter and includes an adjustable stop which may be set to cut lengths up to 15 inches or longer.

Machine is 23 inches long. 14 inches wide, 14½ inches high and weighs 150 pounds. Metal slitting saw used is 5 x 3/32 x 1/8-inch. The 1/4-horsepower, 1750-revolutions per minute motor required for the saw is sold separately.

## 27. Shaper

Dual controls for table operation from either side and an increase in range of application due to heavier column and redesigned side head are



features of the redesigned hydraulic 36-inch openside shaper built by Rockford Machine Tool Co., Rockford, Ill. As extra equipment power rail elevation is available to simplify set-up work.

Safety devices incorporated in stop and start lever assemblies prevent accidental starting of the table. Shaper has fast cutting and return strokes with infinite selection between a wide range of high and low speeds.

## DEVELOPED BY . . .

**28.** Hansen Mfg. Co., Cleveland 11, O., quick connect and disconnect steam couplings capable of handling pressures up to 350 pounds per square inch. Packing may be adjusted under pressure. Bore is smooth and unrestricted.

**29.** Plomb Tool Co., Los Angeles 54, Calif., the Ratchetor which converts any 1/2-inch drive socket wrench handle or attachment into a ratcheting device. Engagement is every 10-1/2 degrees.

**30.** General Electric Co., Schenectady 5, N. Y., portable leak detector for production testing of hermetically sealed units in which halogen compound is the refrigerant. Leaks releasing 1/100 ounce of Freon per year can be detected.

**31.** Pickett & Eckel Inc., Alhambra, Calif., a climate-proof plastic covered magnesium Ortho-Phase log slide which will not warp or expand. Adjusting screws afford accurate lining up of scales on body and slider.

**32.** R-S Products Corp., Philadelphia, Pa., Leveltronic relay for pressure, liquid and temperature controls. Applications include liquid lever and interface control, pressure and flow control, temperature and high-foam control and alarm.

**33.** Shell Oil Co. Inc., New York 20, N. Y., a drill lubricator used primarily with hand operated automatic drills up to 1/2-inch, and a saw blade lubricant which increases cutting speed, prolongs blade life and reduces cutting temperatures and vibrations.

**34.** Woodworth Specialties Corp., Binghamton, N. Y., hollow leg indicator calipers of stainless steel with spring actuated hand which moves when pressure is applied. Calipers are made in 4-inch size.

**35.** G. W. Smith & Sons Inc., Dayton 3, O., Die Slick No. 4 lubricating compound for lubricating piston on cold chamber die casting machines. Other uses include use on ejector and guide pins on pressure die casting dies and on movable mold parts.

**36.** Weksler Thermometer Corp., New York 12, N. Y., 8-inch chart size, mercury actuated recording thermometers in rust, dust, fume and moisture proof case. Wall and flush mounted and portable models are manufactured.

**37.** Cushman Chuck Co., Hartford 2, Conn., series of high speed air cylinders for machine tool applications. Cylinders, of aluminum alloy forgings are offered in 4-1/2, 6 and 8-inch sizes and will function up to 3500 revolutions per minute.

**38.** Super Tool Co., 21650 Hoover Rd., Detroit, Mich., line of carbide tipped reamers. Ream-Rite line is offered in sizes from 1/4 to 5/8-inch.

**39.** Sheffer Collet Co., Traverse City, Mich., Economy stock pusher, easily adjustable, which will feed to the very end of the stock. Pushers, which eliminate slippage and bounce-back, are offered for stock sizes above 1/4-inch.

**40.** Cowhig Industries, Boston 16, Mass., E.Z.C. illuminated 6 foot flexible steel rule in a 5 ounce aluminum case. Battery and magnifying spotlight type lamp are easily replaceable.

**41.** Chelsea Fan & Blower Co. Inc., Irvington 11, N. J., vertical ceiling or attic fan with automatic ceiling shutter, mounting brackets and pull chain switch with fuse link. Offered in three sizes for installation between ceiling and roof.

**42.** Cushman & Denison Mfg. Co., New York 11, N. Y., an automatic valve controlled pocket fountain brush for marking, drawing and writing on any surface. Four interchangeable hard felt nibs produce lines of varying widths.

**43.** Wagner Electric Corp., St. Louis 14, Mo., dry type class B insulated load center transformers for plant power distribution circuits. Of a wide variety of ratings, all are rated 80°C rise, with natural ventilation.

**FOR MORE INFORMATION**
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

# Market Summary

**ALLOCATIONS**—Thousands of small manufacturing companies may be affected by the voluntary steel allocations program should a proposal under consideration by the Office of Industry Co-operation to bring the steel warehouses into the plan be acted upon favorably.

Continued complaints from small business of inability to obtain adequate steel supplies has directed attention of OIC to the possibility of solving the small steel buyers' supply problem through co-operation of the warehouse industry. The proposal is only in the idea stage as yet. Tempo of the allocations program generally has been stepped up.

**STEEL SUPPLY**—Increasing shortage of semifinished steel is threatening serious curtailment of steel finishing mill operations. At Cleveland two American Steel & Wire Co. plants have been compelled to reduce the work-week from five to four days because of a shortage of billets resulting from reduction of semifinished output at the Lorain Works of National Tube Co. due to a furnace repair and expansion program. The Steel & Wire company's Chicago operations may be similarly affected.

As a general thing higher steel production is in prospect with the spring season near. Gas and fuel shortages are easing and scrap is moving more freely. Steel consumers generally anticipate better receipts over the next few months though new tonnage may not be as heavy as was promised for first quarter.

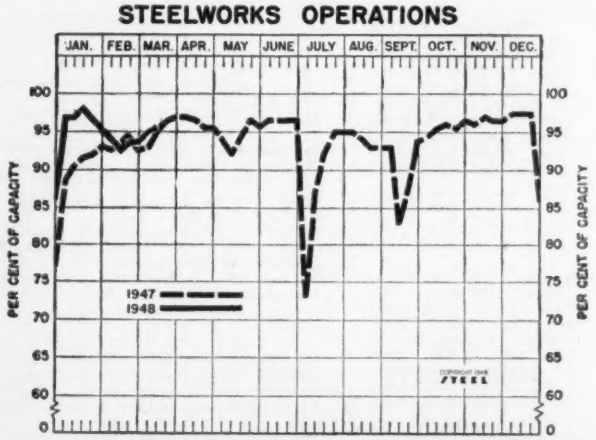
**DEMAND**—Pressure for steel products continues unabated though increasing caution is noted among buyers ordering ahead. Production still falls short of demand in most categories. Increasing resistance to gray market offerings of sheets and strip at high prices is reported but substantial tonnage continues to move in this area. Plate consumers are finding it difficult to obtain adequate supplies and some of them are buying ingots at $80 to $100 per ton for conversion at plate mills with surplus capacity.

**RAW MATERIALS**—Broadly, supply of steelworks scrap and more particularly pig iron will continue more scarce than plentiful for some time to come. However, hopes are high some easing in supply will develop to permit improvement in overall steel output. Supply outlook in other raw materials is not too encouraging. Mill stocks of coal amount to only about enough to support a month's operations and steel producers are keeping their fingers crossed lest John L. Lewis take another holiday and close the mines some time in the next month or so. Then, iron ore stocks at lower lake docks and furnaces are dangerously low and by the opening of the 1948 lake navigation season will be the smallest in several decades. Limestone supply prospects for coming months are not bright because of the shortage of cargo space.

**PRICES**—Price adjustments continue to be made by individual steel producers but there is no sign of any industry-wide change in prospect at this time. Last week one producer of coated strip advanced its prices $3 per ton to compensate for cost increases all along the line. National Tube Co. discontinued the practice of selling seamless pipe on the lapweld pipe discount basis to former jobber and distributor customers of the latter item. Similar action also has been taken by Republic Steel Corp. on electric weld pipe, and another producer is reported planning to follow Apr. 1. These price actions involve an insignificant portion of total pipe mill output. The price increase resulting is estimated to range from $1 to $2 per ton.

Composite market averages, as compiled by STEEL, held unchanged last week and compared with those of a year ago as follows: Finished steel, $81.14 and $69.82; semifinished steel, $68.72 and $52.10; steelmaking pig iron, $39.38 and $32.49; steelmaking scrap, $40.17 and $37.92.

## STEELWORKS OPERATIONS




## DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

| | Week Ended Mar. 13 | Change | Same Week 1947 | Same Week 1946 |
|---|---|---|---|---|
| Pittsburgh | 95 | + 1 | 95.5 | 92.5 |
| Chicago | 94 | None | 95.5 | 85.5 |
| Eastern Pa. | 92 | + 1 | 88 | 77 |
| Youngstown | 103 | None | 91 | 85 |
| Wheeling | 92.5 | + 2.5 | 89 | 86 |
| Cleveland | 95.5 | + 1.5 | 94 | 93 |
| Buffalo | 101* | None | 90.5 | 75 |
| Birmingham | 100 | None | 99 | 95 |
| New England | 85 | None | 94 | 88 |
| Cincinnati | 106* | + 4 | 91 | 76 |
| St. Louis | 75.5 | None | 74.5 | 67.5 |
| Detroit | 104* | None | 90 | 90 |
| Estimated national rate | 95.5 | + 1 | 95 | 84.5 |

Based on weekly steelmaking capacity of 1,802,476 net tons for 1948; 1,749,928 tons for 1947; 1,762,381 tons for 1946. * Revised basis.

# COMPOSITE MARKET AVERAGES

## Arithmetical Price Composites*

| | Mar. 13 | Mar. 6 | Month Ago Feb. 1948 | Year Ago Mar. 1947 | 5 Years Ago Mar. 1943 |
|---|---|---|---|---|---|
| Finished Steel | $81.14 | $81.14 | $79.86 | $69.82 | $56.73 |
| Semifinished Steel | 68.72 | 68.72 | 67.16 | 52.10 | 36.00 |
| Steelmaking Pig Iron | 39.38 | 39.38 | 39.30 | 32.40 | 23.00 |
| Steelmaking Scrap | 40.17 | 40.17 | 40.48 | 37.25 | 19.17 |

| FINISHED STEEL WEIGHTED COMPOSITE† | |
|---|---|
| Dec. 1947 | 3.49055c |
| Nov. 1947 | 3.47536c |
| Dec. 1946 | 2.91932c |
| Dec. 1942 | 2.38793c |

* Straight Arithmetical Composites: Computed from average industry-wide base prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (rerolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading basing points), and on Steelworks Scrap (No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composite, dollars per net ton; pig iron and scrap, gross ton.

† Finished Steel Weight Composite: Computed in cents per pound, base prices, weighted by actual monthly shipments of following products, representing 80 per cent of tolal steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute; Structural shapes; plates; standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip.

# COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton; others dollars per gross ton.

## Finished Materials

| | March 13, 1948 | Feb., 1948 | Dec., 1947 | Mar., 1947 |
|---|---|---|---|---|
| Steel bars, Pittsburgh | 2.90c | 2.90c | 2.90c | 2.60c |
| Steel bars, del. Philadelphia | 3.356 | 3.356 | 3.318 | 2.98 |
| Steel bars, Chicago | 2.90 | 2.90 | 2.90 | 2.60 |
| Shapes, Pittsburgh | 2.80 | 2.80 | 2.80 | 2.50 |
| Shapes, del. Philadelphia | 2.968 | 2.968 | 2.954 | 2.64 |
| Shapes, Chicago | 2.80 | 2.80 | 2.80 | 2.50 |
| Plates, Pittsburgh | 2.95 | 2.95 | 2.95 | 2.65 |
| Plates, del. Philadelphia | 3.19 | 3.19 | 3.17 | 2.85 |
| Plates, Chicago | 2.95 | 2.95 | 2.95 | 2.65 |
| Sheets, hot-rolled, Pittsburgh | 2.80 | 2.80 | 2.80 | 2.50 |
| Sheets, cold-rolled, Pittsburgh | 3.55 | 3.55 | 3.55 | 3.20 |
| Sheets, No. 10 galv., Pittsburgh | 3.95 | 3.95 | 3.90 | 3.55 |
| Sheets, hot-rolled, Gary | 2.80 | 2.80 | 2.80 | 2.50 |
| Sheets, cold-rolled, Gary | 3.55 | 3.55 | 3.55 | 3.20 |
| Sheets, No. 10 galv., Gary | 3.95 | 3.95 | 3.90 | 3.55 |
| Strip, hot-rolled, Pittsburgh | 3.05 | 2.925 | 2.80 | 2.50 |
| Strip, cold-rolled, Pittsburgh | 3.80 | 3.675 | 3.55 | 3.20 |
| Bright basic, bess. wire, Pittsburgh | 3.775 | 3.775 | 3.675 | 3.425 |
| Wire nails, Pittsburgh | 5.20 | 4.95 | 4.625 | 4.125 |
| Tin plate, per base box, Pittsburgh | $6.70 | $6.70 | $5.75 | $5.75 |

## Semifinished

| | | | | |
|---|---|---|---|---|
| Sheet bars, Pittsburgh, Chicago | $60.00 | $60.00 | $60.00* | $50.00* |
| Slabs, Pittsburgh, Chicago | 45.00 | 40.18 | 47.50* | 42.00* |
| Rerolling billets, Pittsburgh | 45.00 | 40.18 | 47.50* | 42.00* |
| Wire rod ⅜ to ¼-inch, Pitts. | 3.175c | 3.175c | 3.05c | 2.55c |

* Per gross ton.

## Pig Iron

| | March 13, 1948 | Feb., 1948 | Dec., 1947 | Mar., 1947 |
|---|---|---|---|---|
| Bessemer, del. Pittsburgh (N.&S. sides) | $40.996 | $40.996 | $37.913 | $34.83 |
| Basic, Valley | 39.00 | 39.00 | 36.00 | 33.00 |
| Basic, eastern del. Philadelphia | 42.004 | 42.004 | 38.84 | 34.26 |
| No. 2 fdry., del. Pgh. (N.&S. sides) | 40.496 | 40.496 | 37.413 | 34.33 |
| No. 2 fdry., del. Philadelphia | 42.504 | 42.504 | 39.34 | 34.76 |
| No. 2 foundry, Chicago | 39.00 | 39.00 | 36.00 | 33.00 |
| No. 2 foundry, Valley | 39.50 | 39.50 | 36.50 | 33.50 |
| Southern No. 2, Birmingham | 37.88 | 37.88 | 34.88 | 29.28 |
| Southern, No. 2, del. Cincinnati | 42.23 | 40.74 | 37.74 | 34.15 |
| Malleable, Valley | 39.50 | 39.50 | 36.50 | 33.50 |
| Malleable, Chicago | 39.50 | 39.50 | 36.50 | 33.50 |
| Charcoal, low phos., fob Lyles, Tenn. | 55.00 | 55.00 | 50.00 | 40.50 |
| Ferromanganese, fob cars, Pittsburgh | 151.00 | 151.00 | 151.00 | 140.25 |

## Scrap

| | | | | |
|---|---|---|---|---|
| Heavy melt. steel, No. 1, Pittsburgh | $40.25 | $40.44 | $40.00 | $37.25 |
| Heavy melt. steel, No. 2, E. Pa. | 39.00 | 39.125 | 41.625 | 38.50 |
| Heavy melt. steel, No. 1, Chicago | 38.75 | 39.125 | 38.75 | 35.125 |
| Heavy melt, steel, No. 1, Valley | 40.25 | 40.25 | 39.75 | 37.19 |
| Heavy melt. steel, No. 1, Cleveland | 39.75 | 39.75 | 39.25 | 36.19 |
| Heavy melt. steel, No. 1, Buffalo | 44.00 | 43.63 | 42.50 | 37.75 |
| Rails for rerolling, Chicago | 49.75 | 51.00 | 58.625 | 40.75 |
| No. 1 cast, Chicago | 66.00 | 66.00 | 55.875 | 43.25 |

## Coke

| | | | | |
|---|---|---|---|---|
| Connellsville, beehive furnace | $12.50 | $12.50 | $12.25 | $8.875 |
| Connellsville, beehive foundry | 14.875 | 14.78 | 14.50 | 10.375 |
| Chicago, oven foundry, del. | 19.25 | 19.25 | 18.975 | 16.10 |

# FINISHED AND SEMIFINISHED IRON STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants. Delivered prices do not include the 3 per cent federal tax on freight.

## Semifinished Steel

**Carbon Steel Ingots:** Rerolling quality, standard analysis, open market, $90-$95 per gross ton. Forging quality $46, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown.

**Alloy Steel Ingots:** Pittsburgh, $56, per gross ton.

**Rerolling Billets, Blooms, Slabs:** Pittsburgh, Chicago, Gary, Buffalo, Birmingham, $45; Cleveland, $47; sales by smaller interests on negotiated basis at $85 per gross ton, or higher.

**Forging Quality Billets, Blooms, Slabs:** Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, $54.

**Alloy Billets, Slabs, Blooms:** Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $66 per gross ton.

**Sheet Bars:** Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Youngstown, $60 nom.; sales in open market $95-105 per gross ton.

**Skelp:** Pittsburgh, Youngstown, 2.90c per lb.

**Tube Rounds:** Pittsburgh, Chicago, Gary, Cleveland, $69-70; some sellers quoting up to $120.

**Wire Rods:** Pittsburgh, Chicago, Birmingham, ⅜ to ¼-inch, inclusive, $2.80-3.55 per 100 lb. ⅜ to 47/64-in., inclusive, $2.75, Cleveland; Galveston, $2.95; Worcester, $2.90-2.95. San Francisco (base del.), $3.5245.

## Bars

**Hot-Rolled Carbon Bars (O.H. only) and Bar-Size Shapes under 3-in.:** Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham, base, 20 tons one size, 2.90c; Detroit, del., 3.06c; eastern Mich., 3.13c; New York, del., 3.392c; Phila., del., 3.356c; San Francisco (base, del.), 3.6345-3.95c; Los Angeles (base, del.), 3.629-3.86; Seattle, 3.85c, base.

**Rail Steel Bars:** Same basing points as merchant carbon bars, except base is 10 tons. Prices upon application.

**Hot-Rolled Alloy Bars:** Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 3.30c. (Texas Steel Co. uses Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

**Cold-Finished Carbon Bars:** Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 20,000-39,999 lb., 3.55c; Detroit, del., 3.71c; Toledo, 3.78c.

**Cold-Finished Alloy Bars:** Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Canton, base, 4.10c.

**Reinforcing Bars (New Billet):** Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngston, base, 2.75c; San Francisco (base, del.), 3.3345c; Los Angeles (base, del.), 3.329c; Seattle, 3.88c base.

**Reinforcing Bars (Rail Steel):** Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo. Prices upon application.

**Iron Bars:** Single refined, Pittsburgh 7.15c-†7.70c, double refined 8.00-†9.75c; Pittsburgh, staybolt, 8.85c-†11.25c.

† Hand puddled.

## Sheets

**Hot-Rolled Sheets (18 gage and heavier):** Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Point, Ashland, Ky., base, 2.80c; Granite City, 3.175c; Detroit, del., 2.96c; eastern Mich., del., 3.03; Philadelphia, del., 3.04c; New York, del., 3.172c; Los Angeles (base, del.), 3.544c; San Francisco, (base, del.), 3.5495c, (Alan Wood Steel Co., Conshohocken, Pa., quotes 3.40c, Sparrows Point equivalent).

**Cold-Rolled Sheets:** Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.55c; Granite City, 3.65c; Detroit, del., 3.71c; Eastern Mich., del., 3.78c; New York, del., 4.042c; Philadelphia, del., 4.006c.

**Galvanized Sheets, No. 10:** (Based on 5 cent zinc) Pittsburgh, Gary, Birmingham, Sparrows Point, Canton, Middletown, 3.95c; Chicago, 3.95c-4.55c; Youngstown, 3.95c-4.45c; Granite City, 4.35c; New York, del., 4.322c; Philadelphia, del., 4.19c; Los Angeles (base, del.), 4.724c; San Francisco (base, del.), 4.7295c.

**Corrugated Galvanized Sheets, No. 10:** (Based on 5 cent zinc) Pittsburgh, Chicago, Gary, Birmingham base, 4.05c.

**Culvert Sheets, No. 16 flat:** (Based on 5 cent zinc; corrugated 10 cents extra) Pittsburgh, Gary, Birmingham: Copper alloy, 4.55c; copper-iron or pure iron, 4.90c; Chicago, 4.55c-4.90c and 4.90c, respectively; Granite City 5.00c and 5.35c, respectively. Los Angeles (base, del.), 5.344c; San Francisco (base del), 5.3495c.

**Aluminized Sheets:** Hot-dipped, coils or cut to lengths: Pittsburgh, 7.50c.

**Stainless-Clad 20%, annealed and pickled:** Pittsburgh, Washington, No. 304, 22.00c; No. 410, 20.00c; No. 430, 20.50c; No. 446, 27.00c.

**Long Ternes, No. 10:** Pittsburgh, Chicago, Gary, base, 4.05c.

**Enameling Sheets, No. 12:** Pittsburgh, Chicago, Gary, Cleveland, Middletown, 3.95c; Youngstown 3.95c-4.45c; Granite City, 4.05c; Detroit, del., 4.11c; eastern Mich., 4.18c.

**Electrical Sheets, No. 24: Field:** Pittsburgh, Chicago, Gary, 4.50c; Kokomo, Ind., 4.60c. Armature: Pittsburgh, 4.80c-5.30c; Chicago, Gary, 4.80c; Granite City, Ill., 5.25c; Kokomo, Ind., 4.90c. **Electrical:** Pittsburgh, 5.30c-5.80c; Chicago, Gary, 5.30c; Granite City, Ill., 5.75c; Kokomo, Ind., 5.40c. **Motor:** Pittsburgh, 6.05c-6.80c; Chicago, Gary, 6.05c; Granite City, 6.50c.

Dynamo: Pittsburgh, 6.75c; Granite City, 7.20c. Transformer 72, 7.25-8.25c; 65, 7.95-9.20c; 58, 8.65-9.90c; 52, 9.45c, Pittsburgh.

## Strip

**Hot-Rolled Strip:** Pittsburgh, 2.80c-3.30c; Chicago, 2.80c-3.10c; Gary, Birmingham, Youngstown, base, 2.80c; Detroit, del., 2.96c; eastern Mich., del., 3.03c; San Francisco (base, del.), 3.605c; Los Angeles (base, del.), 3.60c.
**Cold-Rolled Strip:** 0.25 carbon and less: Pittsburgh, 3.55c-4.05c; Cleveland, Youngstown, 3.55c; Chicago, base, 3.65c-4.05c; Detroit, del. 3.71c; eastern Mich., 3.78c; Worcester, base, 3.75c-4.45c.
**Cold-Finished Spring Steel:** Pittsburgh, Cleveland base: 0.26-0.40 carbon, 3.55c; over 0.40 to 0.60 carbon, 5.05c; over 0.60 to 0.80, 5.65c; over 0.80 to 1.05, 7.15c; over 1.05 to 1.35, 9.45c; add 0.20c for Worcester.

## Tin, Terne, Plate

**Tin Plate:** Pittsburgh, Chicago, Gary, Warren, O., per base box of 100 lb, 1.25 lb coating $6.60, 1.50 lb coating $6.80; Granite City, Birmingham, Sparrows Point, 1.25 lb coating $6.70, 1.50 lb coating $6.90.
**Electrolytic Tin Plate:** Pittsburgh, Gary, Warren, O., per base box of 100 lb, 0.25 lb tin, $5.80; 0.50 lb tin, $6.00; 0.75 lb tin $6.20; Granite City, Birmingham, Sparrows Point, $5.90, $6.10, $6.30, respectively.
**Can Making Black Plate:** Pittsburgh, Gary, Warren, O., per base box of 100 lb 0.55 to 0.70 lb tin, $5.20; 0.75 to 0.95 lb tin, $5.10; 100 to 128 lb tin, $5.20.
**Holloware Enameling Black Plate:** Pittsburgh, Chicago, Gary, Warren, O., base 29-gage, 4.75c per lb; Granite City, Birmingham, Sparrows Point, 4.85c per lb.
**Manufacturing Ternes (Special Coated):** Pittsburgh, Chicago, Gary, per base box of 100 lb, $5.90; Granite City, Birmingham, Sparrows Point, $6.00.
**Roofing Ternes:** Pittsburgh, per package 112 sheets; 20 x 28 in., coating I.C. 8-lb $15.50.

## Plates

**Carbon Steel Plates:** Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, 2.95c; Coatesville, 3.45c; Claymont, 3.65c; Geneva, Utah, (base, del.), 3.125c; Det., del., 3.21c; New York, del., 3.322c; Phila., del., 3.19c; Boston, del., 3.423c; St. Louis, del., 3.269c; San Francisco and Los Angeles, del., 3.693c for sizes and grades produced at Geneva, 3.76c for sizes and grades produced at Fontana, Calif.
(Central Iron & Steel Co., Harrisburg, Pa., 4.75c, basing points.)
**Floor Plates:** Pittsburgh, Chicago, Cleveland, 4.20c.
**Open-Hearth Alloy Plates:** Pittsburgh, Chicago, 3.80c-4.137c; Coatesville, 4.80c.
**Clad Steel Plates:** Coatesville, 10% cladding: Nickel clad, 21.50c; inconel-clad, 30.00c; monel-clad, 24.00c. Pittsburgh, Washington, Coatesville, Pa., 20% stainless-clad, base prices including annealing and pickling: No. 304, 24.00c; No. 410, 22.00c; No. 430, 22.50c; No. 446, 29.00c.

## Shapes

**Structural Shapes:** Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.80c; New York, del., 3.088c; Phila., del., 2.968c; Geneva, Utah (base, del.), 2.975c; Los Angeles (base, del.), 3.41-3.474c for sizes produced at Torrance, Calif., beyond sizes at Geneva; Los Angeles and San Francisco, del., 3.543c for sizes produced at Geneva; San Francisco, del., 3.41c for sizes produced at Fontana, Calif.
**Alloy Structural Shapes:** Pittsburgh, Chicago, 3.55c.
**Steel Piling:** Pittsburgh, Chicago, Buffalo, $3.30 per 100 lb.

## Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham per 100 pounds.)
**Wire to Manufacturers in carloads**
Bright, basic or bessemer..... *$3.55–4.00
Basic MB Spring (except Birm.).. **$4.95
Upholstery Spring (except Birm.) †$4.60
**Wire Products to Trade in carloads**
**Wire,** Merchant Quality
Annealed (6 to 8 base) ..... ††$4.20
Galvanized (6 to 8 base) ..... ††$4.65
(Fob Pittsburgh, Chicago, Duluth, Birmingham, per base column).
**Nails**
Standard, cement-coated, galvanized.. ‡94
Staples, polished and galvanized..... ‡‡94
**Woven fence,** 15½ gage and heavier.. $100
**Barbed wire,** 80-rod spool ..... §§113
**Fence Posts** (with clamps)..... 107
**Bale ties,** single loop ..... §99

* Worcester, $3.65; Duluth, $3.60, base; San Francisco (base, del.), $4.56, bright basic only.
** Worcester, $5.05; Duluth & Trenton, N.J., $5.20 (bright only); San Francisco (base del.) $5.9845.
† Worcester $4.70; Duluth and Trenton, N. J., $4.85, base. San Francisco (base, del.) $5.6345 black upholstery.
†† Worcester $4.30, annealed; $4.75, galvanized. Duluth $4.20, annealed, $4.65, galvanized. San Francisco (base, del.) $5.21, annealed, $5.66 galvanized.
‡ Cols. 108 and 114 also quoted Pittsburgh; Worcester 100; Cleveland 97; San Francisco (base, del.) 115.
‡‡ Cols. 108 and 114 also quoted Pittsburgh; Worcester 100, San Francisco (base del.) 115.
§ San Francisco (base del.) 123.
§§ San Francisco (base del.) 133.

## Rails, Supplies

**Rails:** Standard, over 60-lb fob mill, $2.75 per 100 lb. Light rails (billet), Pittsburgh, Birmingham, $3.10 per 100 lb; light rails (rail steel), Williamsport, Pa., Pittsburgh prices upon application.
Relaying, 60 lb and over fob warehouse $60-$65 per net ton.
**Supplies:** Track bolts, 7.00c; heat treated, 7.25c. Tie plates, $3.65 per 100 lb, fob mill; $3.40 base, Seattle; $3.80 base, Pittsburg, Calif. Splice bars $3.85 per 100 lb, fob mill. Standard spikes, 4.85c; screw spikes, 6.75c. Axles, 4.50c.

## Tubular Goods

**Standard Steel Pipe:** Base price in carlots, threaded and coupled, to consumers about $200 a net ton. Base discounts Pittsburgh on all types; Lorain on steel butt weld, and seamless; Gary, Ind., 2 points less on steel lap weld and 1 point less on steel butt weld on sizes produced in that district.

| | Butt Weld | | | | | |
|---|---|---|---|---|---|---|
| In. | Blk. | Gal. | In. | | Blk. | Gal. |
| ⅛ ..... | 44½ | 17 | 1 ..... | | 52½ | 36½ |
| ¼ ..... | 44½ | 21½ | 1¼ ..... | | 53 | 37 |
| ⅜ ..... | 41 | 17 | 1½ ..... | | 53½ | 37½ |
| ½ ..... | 47 | 29½ | 2 ..... | | 54 | 38 |
| ¾ ..... | 50 | 33½ | 2½ & 3.. | | 54½ | 38½ |

| | Lap Weld | | Elec. Weld | | Seamless | |
|---|---|---|---|---|---|---|
| In. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. |
| 2 .... | 44½ | 28 | 44 | 27½ | 43½ | 27 |
| 2½-3.. | 48½ | 32 | 47 | 30½ | 46½ | 30 |
| 3½-6.. | 50½ | 34 | 49 | 32½ | 48½ | 32 |

**Line Steel Pipe:** Base price in carlots to consumers about $200 a net ton. Base discounts Pittsburgh and Lorain, O.

| | Butt Weld | | Butt Weld |
|---|---|---|---|
| In. | | In. | |
| ⅛ ..... | 43½ | 1 ..... | 51½ |
| ¼ ..... | 43½ | 1¼ ..... | 52 |
| ⅜ ..... | 40 | 1½ ..... | 52½ |
| ½ ..... | 46 | 2 ..... | 53 |
| ¾ ..... | 49 | 2½ & 3 ..... | 53½ |

| In | Lap Weld | Elec. Weld | Seamless |
|---|---|---|---|
| 2 ..... | 43½ | 43 | 42½ |
| 2½ & 3 ..... | 47½ | 46 | 45½ |
| 3½-6 ..... | 49½ | 48 | 47½ |
| 8 ..... | 55½ | 50 | 49½ |
| 10 ..... | 55 | 49½ | 49 |
| 12 ..... | 54 | 48½ | 48 |

**Standard Wrought Iron Pipe:** Base price in carlots, threaded and coupled, to consumers about $200 a net ton. Base discounts Pittsburgh.

| | Butt Weld | | | Lap Weld | |
|---|---|---|---|---|---|
| In | Blk. | Gal. | In | Blk. | Gal. |
| ½ ...+11 | | +35 | 2 .....—1½ | | +20 |
| ¾ ....+ 1½ | | +25 | 2½-3½ .—4 | | +16 |
| 1 and 1¼ .— 4 | | +16½ | 4 .....—8 | | +10½ |
| 1½ ...— 9½ | | +13 | 4½-8...—6 | | +12 |
| 2 ....—10 | | +12½ | | | |

**Boiler Tubes:** Net base prices per 100 ft, fob Pittsburgh, in carload lots, minimum wall thickness, cut lengths 4 to 24 feet, inclusive.

| | | ——Seamless—— | | —Elec. Weld— | |
|---|---|---|---|---|---|
| O.D. | | Hot | Cold | Hot | Cold |
| Sizes | B.W.G. | Rolled | Drawn | Rolled | Drawn |
| 1"..... | 13 | .... | $12.46 | $11.51 | $11.51 |
| 1¼".. | 13 | .... | 14.76 | 11.48 | 13.64 |
| 1½".. | 13 | $14.00 | 16.47 | 12.69 | 15.22 |
| 1¾".. | 13 | 15.92 | 18.74 | 14.43 | 17.31 |
| 2"..... | 13 | 17.84 | 20.99 | 16.17 | 19.39 |
| 2¼".. | 13 | 19.88 | 23.40 | 18.02 | 21.62 |
| 2¼".. | 12 | 21.90 | 25.77 | 19.86 | 23.80 |
| 2½".. | 12 | 23.99 | 28.21 | 21.75 | 26.06 |
| 2¾".. | 12 | 25.42 | 29.90 | 23.05 | 27.63 |
| 3"..... | 12 | 26.68 | 31.40 | 24.18 | 29.00 |
| 3¼".. | 11 | 31.06 | 36.55 | 28.16 | 33.77 |
| 3½".. | 11 | 33.35 | 39.26 | 30.23 | 36.27 |
| 4"..... | 10 | 41.40 | 48.70 | 37.53 | 44.99 |
| 4½".. | 9 | 54.87 | 64.58 | .... | .... |
| 5"..... | 9 | 63.52 | 74.74 | .... | .... |
| 6"..... | 7 | 97.51 | 114.73 | .... | .... |

**Pipe Cast Iron:** Class B, 6-in. and over $79.50 per net ton, Birmingham; $84.50, Burlington, N. J.; $91.12, del. Chicago; 4-in. pipe, $5 higher; class A pipe, $5 a ton over Class B.

## Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago; add 19c per cwt in carlots, Lebanon, Pa. Additional discounts: 5 for carloads; 15 for full containers, except tire, step, plow bolts.

**Carriage and Machine Bolts**

| | |
|---|---|
| ½-in. and smaller; up to 6 in. in length | 45 off |
| ⅝ and ⅝ x 6-in. and shorter ..... | 46 off |
| ⅝-in. and larger x 6-in. and shorter.. | 43 off |
| All diameters longer than 6-in. ..... | 41 off |
| Tire bolts ..... | 35 off |
| Step bolts ..... | 43 off |
| Plow bolts ..... | 54 off |
| Lag bolts | |
| All diameters 6 in. and shorter..... | 46 off |
| All diameters longer than 6 in. ..... | 44 off |

**Stove Bolts**

In packages, nuts separate, 65-10 off; bulk 75 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

**Nuts**

| Semifinished hexagon | A.S. Light | A.S. Reg. and Heavy |
|---|---|---|
| ⅞-in. and smaller..... | 46 off | ..... |
| 1-in. and smaller..... | ..... | 44 off |
| ½-in.-1-in. ..... | 44 off | ..... |
| 1⅛-in.-1-in. ..... | ..... | 43 off |
| 1⅛-in.-1½-in. ..... | 42 off | 41 off |
| 1⅝-in. and larger ..... | ..... | 35 off |

Additional discount of 15 for full containers.

**Hexagon Cap Screws (Packaged)**

| | |
|---|---|
| Upset 1-in. smaller by 6-in. and shorter (1020 bright) ..... | 53 off |
| Upset (1035 heat treated) | |
| ⅝ and smaller x 6 and shorter..... | 48 off |
| ¾, ⅞, & 1 x 6 and shorter ..... | 44 off |

**Square Head Set Screws**

| | |
|---|---|
| Upset 1-in. and smaller ..... | 57 off |
| Headless, ¼-in. and larger ..... | 40 off |
| No. 10 and smaller ..... | 52 off |

## Rivets

Fob Pittsburgh, Cleveland, Chicago, Birmingham

| | |
|---|---|
| Structural ½-in. and larger ..... | 5.65c |
| Lebanon, Pa. ..... | |
| ..... 5.65c plus 19c per cwt in c..., 26c lcl. | |
| ⅞-in and under ..... | 55 off |
| Lebanon, Pa. ..... | |
| ..... 55 off plus 19c per cwt in cl., 26c lcl. | |

## Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, lcl ..... $1-$2 off

## Tool Steels

**Tool Steels:** Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; reg. carbon 16.00-17.00c; extra carbon 20.00c; special carbon 24.00c; oil-hardening 26.00c; high carbon-chromium 47.00c.

| W | Cr | V | Mo | Base Per lb |
|---|---|---|---|---|
| 18.00 | 4 | 1 | ... | 82.00c |
| 1.5 | 4 | 1 | 8.5 | 59.00c |
| 12 | 3 | 0.50 | ... | 67.00c |
| 6.40 | 4.15 | 1.90 | 5 | 63.00c |
| 5.50 | 4.50 | 4 | 4.50 | 80.00c |

## Stainless Steels

Base, Cents per lb

| Grade | Bars, Drawn Wire, Structurals | Plate | Sheets | Hot Rolled Strip | Cold Rolled Strip |
|---|---|---|---|---|---|
| **CHROMIUM NICKEL STEELS** | | | | | |
| 301.... | 26.00c | 29.50c | 37.00c | 22.00c | 28.00c |
| 302.... | 26.00 | 29.50 | 37.00 | 23.50 | 30.50 |
| 303.... | 28.50 | 31.50 | 39.00 | 29.50 | 36.00 |
| 304.... | 27.50 | 31.50 | 39.00 | 25.50 | 32.50 |
| 308.... | 31.50 | 37.00 | 44.50 | 31.00 | 38.00 |
| 309.... | 39.00 | 43.50 | 51.00 | 40.50 | 51.00 |
| 310.... | 53.50 | 56.50 | 57.00 | 53.00 | 61.00 |
| 316.... | 43.50 | 48.00 | 52.00 | 43.50 | 52.00 |
| 321.... | 31.50 | 37.00 | 44.50 | 32.00 | 41.50 |
| 347.... | 36.00 | 41.50 | 49.00 | 36.00 | 45.50 |
| 431.... | 21.00 | 24.00 | 31.50 | 19.00 | 24.50 |
| 440A .. | 26.00 | 31.00 | 36.50 | 26.00 | 30.50 |
| **STRAIGHT CHROMIUM STEEL** | | | | | |
| 408.... | 23.50 | 27.00 | 32.00 | 23.00 | 29.50 |
| 410.... | 20.50 | 23.50 | 29.00 | 18.50 | 24.00 |
| 416.... | 21.00 | 24.00 | 29.50 | 20.00 | 25.50 |
| 420.... | 26.00 | 31.00 | 36.50 | 26.00 | 39.50 |
| 430.... | 21.00 | 24.00 | 31.50 | 19.00 | 24.50 |
| 430F .. | 21.50 | 24.50 | 32.00 | 20.50 | 27.00 |
| 442, 443 | 24.50 | 28.00 | 35.50 | 26.00 | 35.00 |
| 446.... | 30.00 | 33.00 | 39.50 | 38.00 | 56.50 |
| †501... | 9.00 | 13.00 | 17.50 | 13.00 | 18.50 |
| †502... | 10.00 | 14.50 | 18.50 | 14.50 | 19.50 |
| **‡STAINLESS CLAD STEEL (20%)** | | | | | |
| 304.... | .... | .... | 24.00 | 22.00 | .... | .... |
| 410.... | .... | .... | 22.00 | 20.00 | .... | .... |
| 430.... | .... | .... | 22.50 | 20.50 | .... | .... |
| 446.... | .... | .... | 29.00 | 27.00 | .... | .... |

† Low chromium. ‡ Fob Pittsburgh and Washington, Pa.; plate prices include annealing and pickling.

# RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

## Pig Iron

Per Gross Ton

| | Basic | No. 2 Foundry | Malleable | Bessemer |
|---|---|---|---|---|
| **Bethlehem, Pa.,** base | $40.00 | $40.50 | $41.00 | $41.50 |
| Newark, N. J., del. | 42.208 | 42.708 | 43.208 | 43.708 |
| Brooklyn, N. Y., del. | .... | 44.10 | 44.60 | .... |
| Philadelphia, del. | 42.004 | 42.504 | 43.004 | 43.504 |
| **Birmingham,** base | 35.88† | 36.38† | .... | .... |
| Cincinnati, del. | .... | 42.23 | .... | .... |
| **Buffalo,** base | 40.00† | 40.00† | 40.50† | 41.00 |
| Boston, del. | 47.776 | 47.776 | 48.276 | .... |
| Rochester, del. | 42.22 | 42.22 | 42.72 | 43.22 |
| Syracuse, del. | 43.025 | 43.025 | 43.525 | 44.025 |
| **Chicago,** base | 38.50 | 39.00 | 39.50 | 40.00 |
| Milwaukee, del. | 40.08 | 40.58 | 41.08 | 41.58 |
| Muskegon, Mich., del. | .... | 43.60 | 44.10 | .... |
| **Cleveland,** fob furnace | 38.50† | 39.00† | 39.50† | 40.00 |
| Akron, del. | 40.50 | 41.00 | 41.50 | 42.00 |
| **Duluth,** base | 39.00 | 39.50 | 40.00 | 40.50 |
| **Erie, Pa.,** base | 38.50 | 39.00 | 39.50 | 40.00 |
| **Everett, Mass.,** base | .... | 45.00 | 45.50 | .... |
| **Granite City, Ill.,** base | 39.50 | 40.00 | 40.50 | .... |
| St. Louis, del. | 40.25 | 40.75 | 41.25 | .... |
| ‡**Neville Island, Pa.,** base | 39.00 | 39.50 | 39.50 | 40.00 |
| Pittsburgh, del., N.&S. Sides | 39.996 | 40.496 | 40.496 | 40.996 |
| **Provo, Utah,** base | 39.00 | 39.50 | .... | .... |
| Seattle, Tacoma, Wash., del. | .... | 46.63 | .... | .... |
| Portland, Oreg., del. | .... | 46.63 | .... | .... |
| Los Angeles, San Francisco | 46.13 | 46.63 | .... | .... |
| **Sharpsville, Pa.,** base | 39.00 | 39.50 | 39.50 | 40.00 |
| **Steelton, Pa.,** base | 40.00 | 40.50 | 41.00 | 41.50 |
| **Struthers, O.,** base | 39.50 | .... | .... | .... |
| **Swedeland, Pa.,** base | 45.00 | 45.50 | 46.00 | 46.50 |
| **Toledo, O.,** base | 38.50 | 39.00 | 39.50 | 40.00 |
| Cincinnati, del. | 42.70 | 43.20 | .... | .... |
| **Youngstown, O.,** base | 39.00 | 39.50 | 39.50 | 40.00 |
| Mansfield, O. | 42.57 | 43.07 | 43.07 | 43.57 |

† Republic Steel Corp. quotes $3 a ton higher at Birmingham, effective Jan. 1, 1948; Republic quotes $5.50 higher for No. 2 foundry and malleable and $5.00 higher for basic at Buffalo, and $1.25 higher at Cleveland, effective on shipments during week ended Mar. 14.

‡ To Neville Island base add: 79.2c for McKees Rocks, Pa., $1.212 Lawrenceville, Homestead, McKeesport, Monaco; $1.788 Oakmont; $1.596 Verona; $1.788 Brackenridge; 99.6c to Ambridge and Aliquippa.

### Blast Furnace Silvery Pig Iron

6.00-6.50 per cent (base)....$49.50
6.51-7.00..$50.75 9.01- 9.50. 57.00
7.01-7.50.. 52.00 9.51-10.00. 58.25
7.51-8.00.. 53.25 10.01-10.50. 59.50
8.01-8.50.. 54.50 10.51-11.00. 60.75
8.51-9.00.. 55.75 11.01-11.50. 62.00

Fob Jackson, O., per gross ton; Buffalo base $1.25 higher. Buyer may use whichever base is more favorable.

### Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

**Electric Furnace Silvery Pig Iron** 8% 14.01-14.50%, $77.50, Jackson, O.; $78.75, Niagara Falls; $78 open-hearth and $79 foundry grade, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.05% Mn over 1%; $1 a ton for 0.045% max. phos.

### Charcoal Pig Iron

Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn.....$55.00 (For higher silicon irons a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

### Gray Forge

Neville Island, Pa. .....$39.00

### Low Phosphorus

Steelton, Pa., Buffalo, Troy, N. Y., $46.00. Philadelphia, $48.592, delivered. Intermediate phosphorus, Central furnace, Cleveland, $42.00.

### Differentials

Basing point prices are subject to following differentials:

**Silicon:** An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

**Phosphorus:** A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

**Manganese:** An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

**Nickel:** An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

## Metallurgical Coke

Price per Net Ton

### Beehive Ovens

| | |
|---|---|
| Connellsville, furnace | $12.00-$13.00 |
| Connellsville, foundry | 14.00- 15.75 |
| New River, foundry | 12.50 |
| Wise county, foundry | 11.15 |
| Wise county, furnace | 10.65 |

### Oven Foundry Coke

| | |
|---|---|
| Kearney, N. J., ovens | $18.75 |
| Chicago, outside del. | 18.00 |
| Chicago, del. | 19.25 |
| Terre Haute, ovens | 18.50 |
| Milwaukee, ovens | 18.75 |
| New England, del. | 20.40-20.45 |
| Birmingham, del. | 15.76 |
| Indianapolis, ovens | 18.50 |
| Cincinnati, del. | 18.95 |
| Ironton, O., ovens | 16.75 |
| Erie, Pa., del. | 19.45 |
| Painesville, O., ovens | 18.10 |
| Cleveland, del. | 19.60 |
| Buffalo, del. | 20.15 |
| Detroit, del. | 19.00 |
| Philadelphia, ovens | 17.75 |
| Swedeland, Pa., ovens | 17.75 |
| Portsmouth, O., ovens | 17.00 |

## Coal Chemicals

Spot, cents per gallon

| | |
|---|---|
| Pure and 90% benzol | 21.00† |
| Toluol, two degrees | 28.00 |
| Industrial xylol | 28.00 |
| Solvent naphtha | 28.00 |

Per pound fob works

| | |
|---|---|
| Phenol (car lots, returnable drums) | 12.50 |
| Do., less than carlots | 13.25 |
| Do., tank cars | 11.50 |

Eastern plants, per pound

| | |
|---|---|
| Naphthalene flakes, balls, bbl. to jobbers, "household use" | 11.00 |

Per ton, bulk, fob plants

| | |
|---|---|
| Sulphate of ammonia | $40.00 |

† Freight allowed up to 2 cents.

## Refractories

Net Prices

Per 1000, fob shipping point

### Fire Clay Brick

Super Duty

| | |
|---|---|
| Pa., Mo., Ky. | $92.00 |

High Heat Duty

| | |
|---|---|
| Pa., Ill., Md., Mo., Ky. | 73.00 |
| Ala., Ga. | 73.00 |
| N. J. | 78.00 |

Intermediate Heat Duty

| | |
|---|---|
| Ohio | 67.00 |
| Pa., Ill., Md., Mo., Ky. | 67.00 |
| Ala., Ga. | 59.00 |
| N. J. | 70.00 |

Low-Heat Duty

| | |
|---|---|
| Pa., Md., Ohio | 59.00 |

### Ladle Brick

(Pa., O., Va., Mo.)

| | |
|---|---|
| Dry Press | 50.00 |
| Wire Cut | 48.00 |

### Malleable Bung Brick

| | |
|---|---|
| All bases | $3.00 |

### Silica Brick

| | |
|---|---|
| Pennsylvania | 73.00 |
| Joliet, E. Chicago | 82.00 |
| Birmingham, Ala. | 73.00 |

### Basic Brick

Net tons, fob Baltimore, Plymouth Meeting, Chester, Pa.

| | |
|---|---|
| Chrome brick | 64.00 |
| Chem. bonded chrome | 64.00 |
| Magnesite brick | 86.00 |
| Chem. bonded magnesite | 75.00 |

### Magnesite

Domestic dead-burned grains, net ton, fob Chewelah, Wash.

| | |
|---|---|
| Bulk | 27.00 |
| Single bags | 31.50 |

### Dolomite

Domestic, dead-burned, bulk, net tons, fob Millmeyer, Blue Bell or Williams, Pa., Millville, W. Va., Nario, Millersville, Martin, Gibsonburg or Woodville, O., $11.05; Midwest (fob Thornton or McCook, Ill.), add $0.10; Missouri Valley (fob Dolly Siding, and Bonne Terre, Mo.), add $0.20.

## Ores

### Lake Superior Iron Ore

*Gross ton, 51½% (Natural) Lower Lake Ports*

| | |
|---|---|
| Old range bessemer | $5.95 |
| Old range nonbessemer | 5.80 |
| Mesabi bessemer | 5.70 |
| Mesabi nonbessemer | 5.55 |
| High phosphorus | 5.55 |

### Eastern Local Ore

*Cents, units, del. E. Pa.*

| | |
|---|---|
| Foundry and basic 56.62% contract | 15.25 |

### Foreign Ore

*Cents per unit, cif Atlantic ports*

| | |
|---|---|
| No. African low phos. | Nom. |
| Swedish basic, 60 to 68% | 13.50-14.00 |
| Spanish, No. African basic, 50 to 60% | Nom. |
| Brazil iron ore, 68-69% fob Rio de Janeiro, nom. | 5.50-6.50 |

### Tungsten Ore

| | |
|---|---|
| Wolframite and scheelite per short ton unit, duty paid | $26-$28 |

### Manganese Ore

48-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 65.00-67.00c.

### Chrome Ore

*Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)*

| | |
|---|---|
| Indian and African | |
| 48% 2.8:1 | $37.50 |
| 48% 3:1 | 39.00 |
| 48% no ratio | 31.00 |
| South African (Transvaal) | |
| 44% no ratio | $25.50-$26.00 |
| 45% no ratio | 26.50 |
| 48% no ratio | 28.50 |
| 50% no ratio | 29.50 |
| Brazilian—nominal | |
| 44% to 2.5:1 lump | $33.65 |
| Rhodesian | |
| 45% no ratio | $27-$27.50 |
| 48% no ratio | 30.00 |
| 48% 3:1 lump | 39.00 |
| Domestic (seller's nearest rail) | |
| 48% 3:1 | $39.00 |

### Molybdenum

| | |
|---|---|
| Sulphide conc., lb., Mo. cont., Mines | $0.75 |

## Fluorspar

Metallurgical grade, fob shipping point, in Ill., Ky., net tons, carloads, effective $CaF_2$ content, 70% or more, $35; less than 60% $32.

## HIGH-STRENGTH—LOW-ALLOY STEELS

Prices in dollars per 100 pounds

| | Pittsburgh | Chicago | Gary | Youngstown | Sparrows Point | Buffalo | Bethlehem | Canton | Massillon |
|---|---|---|---|---|---|---|---|---|---|
| Sheet, Hot-Rolled | 4.30 | 4.30 | 4.30 | 4.30 | 4.30 | 4.30 | ... | ... | ... |
| Cold-Rolled | 5.30 | 5.30 | 5.30 | 5.30 | ... | 5.30 | ... | ... | ... |
| Galvanized | 6.00 | ... | ... | ... | ... | 6.00 | ... | ... | ... |
| Strip, Hot-Rolled | 4.30 | 4.30 | 4.30 | 4.30 | ... | ... | ... | ... | ... |
| Cold-Rolled | 5.30 | 5.30† | 5.30† | 5.30 | ... | ... | ... | ... | ... |
| Shapes, structural | 4.30 | 4.30 | ... | 4.30 | ... | ... | 4.30 | ... | ... |
| Plates | 4.55 | 4.55 | 4.55 | ... | 4.55 | ... | ... | ... | ... |
| Bars, Small Shapes | 4.45 | 4.45 | 4.45 | 4.45 | ... | 4.45 | ... | 4.45 | 4.45 |

† Nax High Tensile, produced by Great Lakes Steel Corp., quoted 10 cents higher.

# WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras.

| | SHEETS | | | | | STRIP | | BARS | | | | PLATES | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H-R 10G | C-R 10G | C-R 17G | Gal. *10G | Gal. *24G | †H-R | †C-R | H-R Rds. ⅜" to 3" | C-F Rds. ½" & up | H-R Alloy (**4140) | Structural Shapes | Carbon ⅜"-¾" | Floor ⅜" & Thicker |
| Boston (city) | 5.03 | 6.09[4] | 5.79[4] | 6.23[4] | 7.58[4] | 5.61 | 6.87 | 5.04 | 5.88 | 7.64 | 4.91 | 5.18 | 6.86 |
| New York (city) | 4.96 | 6.16 | 5.86 | 6.16 | 7.51 | 5.59 | ... | 5.06 | 5.63 | 7.23 | 4.80 | 5.11 | 6.78 |
| New York (country) | 4.81 | 6.01 | 5.71 | 6.01 | 7.36 | 5.44 | ... | 4.91 | ... | ... | 4.65 | 4.96 | 6.63 |
| Philadelphia (city) | 4.70 | 6.32 | 5.92 | 5.90 | 7.25 | 5.32 | 5.72 | 4.87 | 5.75 | 8.77 | 4.57 | 4.85 | 6.47 |
| Philadelphia (country) | 4.55 | 6.18 | 5.78 | 5.75 | 7.10 | 5.17 | 5.57 | 4.73 | ... | ... | 4.47 | 4.71 | 6.32 |
| Baltimore (city) | 4.32† | 5.95 | 5.65 | 5.72 | 7.07 | 4.80 | ... | 4.85 | 5.71 | ... | 4.71 | 4.77 | 6.30 |
| Baltimore (country) | 4.17† | 5.80 | 5.50 | 5.50 | 6.85 | 4.65 | ... | 4.70 | ... | ... | 4.56 | 4.62 | 6.15 |
| Washington (city) | 4.81 | ... | ... | ... | ... | 5.08 | ... | 5.14 | 5.79[12] | ... | 4.98 | 5.03 | 6.60 |
| Washington (country) | 4.71 | ... | ... | ... | ... | 4.98 | ... | 5.04 | ... | ... | 4.88 | 4.93 | 6.50 |
| Norfolk, Va. | 4.90 | ... | ... | ... | ... | ... | ... | 5.20 | 6.00 | ... | 5.15 | 5.15 | 6.90 |
| Memphis, Tenn. (city) | 4.82[20]§§ | 5.87[20]† | ... | 6.37 | ... | 5.02[20] | ... | 4.97[20] | 5.87 | ... | 4.97[20] | 5.17[20] | 6.87[20] |
| Memphis, Tenn. (country) | 4.72[20]§§ | 5.77[20]† | ... | 6.27 | ... | 4.92[20] | ... | 4.87[20] | 5.77 | ... | 4.87[20] | 5.07[20] | 6.77[20] |
| Buffalo (city) | 4.45 | ... | 5.20[8] | 6.05 | ... | 5.25 | 5.65 | 4.40 | 5.10 | 6.85 | 4.40 | 5.00 | 6.25 |
| Buffalo (country) | 4.30 | ... | 5.05[8] | 5.50 | ... | 4.70 | 5.50 | 4.25 | 4.95 | 6.85 | 4.25 | 4.45 | 5.75 |
| Pittsburgh (city) | 4.25§§ | ... | 5.10[8]† | 5.65 | 6.90 | 4.35 | 5.35 | 4.40 | 5.10 | 6.85 | 4.40 | 4.60 | 5.90 |
| Pittsburgh (country) | 4.10§§ | ... | 4.95[8]† | 5.50 | 6.75 | 4.20 | 5.20 | 4.25 | 4.95 | 6.85 | 4.25 | 4.45 | 5.75 |
| Cleveland (city) | 4.45 | 5.50[8] | 5.20[8] | 5.82 | 7.17 | 4.55 | 5.35 | 4.40 | 5.10 | 7.22 | 4.70 | 4.60 | 6.05 |
| Cleveland (country) | 4.30 | 5.35[8] | 5.05[8] | ... | ... | ... | 5.20 | 4.25 | 4.95 | ... | ... | 4.45 | 5.90 |
| Cincinnati | 4.56 | ... | 5.22 | 5.77 | ... | 4.77 | ... | 4.78 | 5.63 | ... | 4.82 | 4.98 | 6.47 |
| Detroit | 4.55 | ... | 5.30 | ... | ... | 4.72 | 5.63 | 4.50 | 5.22 | 7.10 | 4.77 | 4.88 | 6.28 |
| Indianapolis | 4.55 | 5.32[8] | ... | 5.87 | 7.12 | 4.65 | 5.90 | 4.70‡‡ | 5.40 | 8.85 | 4.70 | 4.90 | 6.35 |
| Chicago (city) | 4.45 | 5.50[8] | 5.20[8] | 5.65 | 6.90 | 4.35 | 5.45 | 4.40 | 5.10 | 6.85[9] | 4.40 | 4.60 | 6.05 |
| Chicago (country) | 4.30 | 5.35[8] | 5.05[8] | 5.50 | 6.75 | 4.20 | 5.30 | 4.25 | 4.95 | 6.85[9] | 4.25 | 4.45 | 5.90 |
| Milwaukee | 4.658 | 5.708[8] | 5.408[8] | 5.858 | 7.108 | 4.558 | 5.658 | 4.608 | 5.308 | 7.208[9] | 4.608 | 4.808 | 6.258 |
| St. Louis | 4.78 | 5.83[8] | 5.53[8] | 6.02 | 7.27 | 4.68 | 5.82 | 4.73 | 5.47[12] | ... | 4.73 | 4.93 | 6.38 |
| Birmingham (city) | 4.45[20]§§ | ... | ... | 5.65 | ... | 4.45[20] | ... | 4.40[20] | 5.93[22] | ... | 4.40 | 4.65 | 6.86 |
| Birmingham (country) | 4.30[20]§§ | ... | ... | 5.50 | ... | 4.30[20] | ... | 4.25[20] | ... | ... | 4.25 | 4.50 | ... |
| New Orleans | 4.98[20]** | ... | 6.29[18] | ... | ... | 5.18[20] | ... | 5.13[20]†† | 6.29[11] | ... | 5.03[20]†† | 5.33[20] | 7.29[20] |
| Omaha, Nebr. | 5.462 | ... | ... | 6.712 | 8.012 | 5.362 | ... | 5.412 | 6.112 | 7.562 | 5.412 | 5.612 | 7.062 |
| Houston, Tex. | 5.75 | ... | ... | 7.36 | 8.10 | 6.00 | ... | 5.35 | 7.00[12] | ... | 5.85 | 5.85 | 6.50 |
| Los Angeles (city) | 5.75 | 7.75[8] | 7.45[8] | 7.40 | 8.80 | 6.05 | 8.70 | 5.50 | 7.35[22] | 9.35[10] | 5.35 | 5.55 | 7.65 |
| Los Angeles (country) | 5.60 | 7.60[8] | 7.30[8] | 7.25 | 8.65 | 5.90 | 8.55 | 5.35 | 7.20[2] | 9.20[10] | 5.20 | 5.40 | 7.50 |
| San Francisco | 5.20[21] | 6.65[8] | ... | 6.85[8] | 7.75[8] | 5.75[21] | 8.70[18] | 5.05[21] | 7.00[12] | 9.35 | 5.20[21] | 5.30[21] | 7.10[21] |
| Seattle, Tacoma, Wash. | 5.30[17]§§ | ... | 7.10[8]‡ | 6.95 | ... | 5.60[17] | ... | 5.45[17] | 7.45[19] | 8.50[12] | 5.25[17] | 5.55[17] | 7.65[17] |
| Portland, Oreg. | 5.30[17]§§ | ... | 7.10[8]‡ | 6.70 | ... | 5.60[17] | ... | 5.45[17] | 7.45[19] | ... | 5.25[17] | 5.45[17] | 7.55[17] |

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over, cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [4]—three to 24 bundles; [5]—450 to 1499 lb; [8]—400 to 1499 lb; [9]—1000 to 1999 lb; [11]—1000 to 39,999 lb; [12]—1000 lb and over; [18]—2000 lb and over; [17]—300 to 9999 lb; [18]—1500 to 1999 lb; [19]—1500 to 39,999 lb; [20]—400 to 3999 lb; [21]—400 lb and over; [22]—500 to 1499 lb.

* Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; ** as rolled; †† add 0.40 for sizes not rolled in Birmingham; ‡‡ add 15c for 100 lb for slow moving items; §§ 18 gage and heavier.

# PRICES OF LEADING FERROALLOYS PRODUCTS

## MANGANESE ALLOYS

**Spiegeleisen:** (19-21% Mn, 1-3% Si). Carlot per gross ton, $47, Palmerton, Pa., $51, Pittsburgh. 16% to 19% Mn., $46, Palmerton, $50, Pittsburgh.

**Standard Ferromanganese:** (Mn 78-82%, C 7% approx.). Carload, lump, bulk $145 per gross ton of alloy, carload packed $157, ton lot $172, less ton $189; fob New Orleans, Mobile, Philadelphia, Baltimore, or New York. Carload, lump, bulk $151, fob cars Pittsburgh, including 50c switching charge. Add, or subtract, $1.80 for each 1%, or fraction thereof, of contained manganese over 82% or under 78%.

**West Coast Prices:** Carload (80,000 lb or more), lump, bulk, same price and basing points as above. All other prices for shipment from Pacific Coast warehouses, add $26.21 to above prices. Delivery is fob Portland, Los Angeles, South San Francisco, or Seattle warehouses, with railroad freight allowed on shipments of 25 gross tons or more.

**Low-Carbon Ferromanganese, Regular Grade:** (Mn 80-85%). Eastern Zone, carload, lump, bulk, max. 0.10% C, 22.5c per lb of contained Mn, carload packed 23.25c, ton lot 24.35c, less ton 25.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

**Medium-Carbon Ferromanganese:** (Mn 80-85%, C 1.5% max., Si 1.5% max.). Eastern Zone, carload, lump, bulk 16.5c per lb of contained Mn, carload packed 17.25c, ton lot 18.35c, less ton 19.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

**Manganese Metal:** (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Eastern Zone, carload, 2" x D, bulk 32c per lb of metal, carload packed 32.5c, ton lot 34c, less ton 36c; Central, add 1c for c.l. and 1.45c for l.c.l.; Western, add 1.45c for c.l. and 2.4c for l.c.l. Freight allowed. Spot, add 2c.

**Silicomanganese:** (Mn 65-70%). Eastern Zone, contract, lump, bulk, 1.50% C grade, 17-20% Si, 7.8c per lb of alloy, carload packed, 8.55c, ton lot 9.45c, less ton 10.45; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5 for l.c.l. Freight allowed. For 2.0% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

## CHROMIUM ALLOYS

**High-Carbon Ferrochrome:** Eastern Zone, contract, c.l., lump, bulk 18.6c per lb of contained Cr, c.l., packed 19.5c, ton lot 20.65c, less ton 22.05c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

**"SM" High-Carbon Ferrochrome:** (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

**Foundry Ferrochrome:** (Cr 62-66%, C 5-7%). Eastern Zone, contract, c.l.,8MxD, bulk 20.1c per lb of contained Cr, c.l., packed 21.0c, ton lot 22.35c, less ton 24.1c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

**Low-Carbon Ferrochrome:** (Cr 67-72%). Eastern Zone, contract, carload, lump, bulk, max. 0.03% C 28.5c per lb of contained Cr, 0.04% C 27.5c, 0.05% C 27.0c, 0.06% C 26.5c, 0.10% C 26.0c, 0.15% C25.5c, 0.20% C 25.25c, 0.50% C 25.0c, 1% C 24.5c, 2% C 24.25c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

**"SM" Low-Carbon Ferrochrome:** (Cr 62-66%, Si 4-6%, Mn 4-6%, add C 1.25% max.). Eastern Zone, contract, carload, lump, bulk 25c per lb of contained chromium, carload, packed 26.1c, ton lot 27.3c, less ton 29.1c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

**Low-Carbon Ferrochrome, Nitrogen Bearing:** Add 2c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 2c for each 0.25% of N above 0.75%.

**Chromium Metal:** (Mn. 97% Cr and 1% Fe). Eastern Zone, contract, carload, 1" x D, packed, max. 0.50% C grade, 93c per lb of contained chromium, ton lot 94.5c, less ton 97c; Central, add 1.5c for c.l. and 2.5c for l.c.l.; Western, add 2.75c for c.l. and 4.5c for l.c.l. Freight alowed. Spot, add 5c.

## SILICON ALLOYS

**50% Ferrosilicon:** Eastern Zone, contract, carload, lump, bulk 9.3c per lb of contained Si. carload packed 10.9, ton lot 12.35c, less ton 14.0c; Central, add 0.5c for c.l. and 1.25c for l.c.l.; Western, add 0.7c for c.l. and 1.8c for l.c.l. Freight allowed. Spot, add 0.45c.

**Low-Aluminum 50% Ferrosilicon:** (All 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

**75% Ferrosilicon:** Eastern Zone, contract, carload, lump, bulk 11.8c per lb of contained Si carload packed 13.1c, ton lot 14.25c, less ton 15.5c; Central, add 0.3c for c.l. add 0.75c for l.c.l.; Western, add 1.05c for c.l. and 5c for l.c.l. Freight allowed. Spot, add 0.3c.

**85% Ferrosilicon:** Eastern Zone, contract, carload, lump, bulk 13.3c per lb of contained, Si carload packed 14.55c, ton lot 15.55c, less ton 16.7c; Central, add 0.3c for c.l. and 0.7c for l.c.l.; Western, add 1.05c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

**Low-Aluminum 85% Ferrosilicon:** (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

**90% Ferrosilicon:** Eastern Zone, contract, carload, lump, bulk, 15c per lb of contained Si carload packed 16.2c, ton lot 17.15c, less ton 18.2c; Central, add 0.3c for c.l. and 0.65c for l.c.l.; Western, add 1c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

**Low-Aluminum 90-95% Ferrosilicon:** (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

**Silicon Metal:** (Over 97% Si and 1% max. Fe). Eastern Zone, c.l., lump, bulk, regular 17.3c per lb of Si, c.l. packed 18.5c, ton lot 19.4c, less ton 20.4c; Central, add 0.6c for c.l. and 2.25c for l.c.l.; Western, add 1.2c for c.l. and 4c for l.c.l. Add 1c for max. 0.20% calcium grade. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing over 96% Si. Spot, add 0.25c.

**Alsifer:** (Aprox. 20% Al, 40% Si, 40% Fe) Contract basis fob Niagara Falls, N. Y., lump per lb c.l. 6.90c; ton lots packed, 7.40c; 200 to 1999 lb, 8.15c; smaller lots, 8.65c. Spot up 0.5c.

## BRIQUETTED ALLOYS

**Chromium Briquets:** (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Eastern Zone, contract, carload, bulk, 12.5c per lb or briquet, carload packed 13.2c ton lot 14.0c, less ton 14.9c; Central, add 0.25c for c.l. and 0.9c for l.c.l.; Western, add 0.35c for c.l. and 1.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

**Ferromanganese Briquets:** (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Eastern Zone, contract, carload, bulk, 8.7c per lb of briquet, c.l. packaged 9.5c, ton lot 10.3c, less ton 11.2c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

**Silicomanganese Briquets:** (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Eastern Zone, contract, c.l. bulk 8.75c per lb of briquet, c.l. packed 9.55c, ton lot 10.35c, less ton 11.25c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

**Silicon Briquets: (Large size**—weighing approx. 5 lb and containing exactly 2 lb of Si). Eastern Zone, contract, carload, bulk 5.1c per lb of briquet, c.l. packed 5.25c, ton lot 6.7c, less ton 7.6c. **(Small size**—weighing approx. 2½ lb and containing exactly 1 lb of Si). Eastern Zone, carload, bulk 5.25c, c.l. packed 6.05c, ton lot 6.85c, less ton 7.75c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.45c for c.l. and 0.9c for l.c.l. Freight allowed. Add 0.25c for notching, small size only. Spot, add 0.25c.

### CALCIUM ALLOYS

**Calcium-Manganese-Silicon:** (Ca 16-20%, Mn 14-18%, and Si 53-59%). Eastern Zone, contract, carload, lump, bulk 17.50c per lb of alloy, carload packed 19.0c, ton lot 19.8c, less ton 20.8c; Central, add 0.5c for c.l. and 0.85c for l.c.l.; Western, add 2.55c for c.l. and 2.6c for l.c.l. Freight allowed. Spot, add 0.25c.

**Calcium-Silicon:** (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Eastern Zone, contract, carload, lump, bulk 16.25c per lb of alloy, carload packed 16.45c, ton lot 19.35c, less ton 20.85c; Central, add 0.5c for c.l. and 0.75c for l.c.l.; Western, add 2.55c for c.l. and 2.90c for l.c.l. Freight allowed. Spot, add 0.25c.

### VANADIUM ALLOYS

**Ferrovanadium: Open Hearth Grade** (Va 50-55%, Si 8% max., C 3% max.). Eastern Zone, contract, any quantity, $2.90 per lb of contained Va; Central, add 2c for c.l. and 3c for l.c.l.; Western, add 6c for c.l. and 9c for l.c.l. Freight allowed. Spot, add 10c. **Special Grade** (Va 50-55%, Si 4% max., C 1% max.), $3. **High Speed Grade** (Va 50-55%, Si 1.50% max., C .20% max.), $3.10.

**Vanadium Oxide:** All Zones, contract, less carload lots, $1.20 per lb of contained $V_2O_5$. Spot, add 5c.

**Grainal:** Vanadium Grainal No. 1, 93c; No. 6, 63c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

### TITANIUM ALLOYS

**Ferrotitanium:** (Ti 20-25%, Al 3% max., Si 4% max., C 0.10% max.). Eastern Zone, contract, ton lot, 2" x D, $1.35 per lb of contained Ti, less ton $1.40. (Ti 40-45%, Al 7% max., Si 4% max., C 0.10% max.). Ton lot $1.23, less ton $1.25; Central, add 4c for 20-25% Ti grade, and 2.1c for 40-45% grade; Western, add 13.5c for 20-25% Ti grade, and 7.2c for 40-45% grade. Freight allowed. Spot, add 5c.

**Ferrotitanium, High-Carbon:** (15-20%). Contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C, $142.50; 3-5% C, $157.50.

### TUNGSTEN ALLOYS

**Ferrotungsten:** (W 70-80%). Eastern Zone, contract, 10,000 lb W or more, $2.25 per lb of contained W; 200 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

**Tungsten Powder:** (W 98.8% min.). Eastern Zone, contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

### ZIRCONIUM ALLOYS

**12-15% Zirconium Alloys:** (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Eastern Zone, contract, c.l., lump, bulk 6c per lb of alloy, c.l. packed 6.75c, ton lot 7.5c, less ton 8.35c; Central, add 0.25c for c.l. and 1.1c for l.c.l.; Western, add 0.6c for c.l. and 3.95c for l.c.l. Freight allowed. Spot, add 0.25c.

**35-40% Zirconium Alloy:** (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Eastern Zone, contract, carload, lump, packed 18.4c per lb of alloy, ton lot 19.15c, less ton 20.40c; Central, add 0.6c for c.l. and 1.05c for l.c.l.; Western add 3.05c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

### BORON ALLOYS

**Ferroboron:** (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Eastern Zone, contract, 100 lb or more, 1" x D, $1.20 per lb of alloy, freight allowed. Less than 100 lb $1.30; Central, add 0.75c; Western add 2.9c, freight allowed. Spot, add 5c.

**Borosil:** (3 to 4% B, 40 to 45% Si). $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

**Bortam:** (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

**Carbortam:** (B 0.90 to 1.15%). Net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

### OTHER FERROALLOYS

**Ferrocolumbium:** Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Eastern Zone, contract, ton lot, 2" x D, $2.50 per lb of contained Cb, less ton $2.55; Central, add 1.65c; Western, add 6.45c. Freight allowed. Spot, add 10c.

**CMSZ Mixes:** No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Eastern Zone, carload, 12 M x D, carload packed 17.25c per lb of material, ton lot 18.00c, less ton 19.25c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

**Silcaz Alloy:** (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Eastern Zone, carload, packed, 1" x D, 39c per lb of alloy, ton lot 41c, less ton 43c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

**SMZ Alloy:** (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Eastern Zone, contract, carload, packed, ½" x 12 M, 15.0c per lb of alloy, ton lot 15.75c, less ton 17.0c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed. Spot, add 0.25c.

**Simanal:** (Approx. 20% each Si, Mn, Al). Packed, lump, carload 10c, ton lots 10.25c, smaller lots 10.75c per lb alloy; freight not exceeding St. Louis rate allowed.

**Ferrophosphorus:** 17-19% based on 18% P content with unitage of $3 for each 1% of P above or below the base) Gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

**Ferromolybdenum:** (55-75%). Per lb, contained Mo. fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.

# Major Nonferrous Metal Prices Hold Steady

**NEW YORK** — American Smelting & Refining Co. and subsidiaries reported production of refineries (excluding alloys, by-products and fabricated products) from products treated on toll for account of others, products of purchased materials, and products of owned, partly owned or leased mines in 1947 and 1946, respectively, as follows: Copper, 473,577 and 251,195 net tons; lead, 559,869 and 231,195 tons; zinc, 135,432 and 124,189 tons; silver, 80,861,314 and 47,674,207 ounces; and gold, 1,367,440 and 782,657 ounces.

**TIN** — Production of tin ores and concentrates in the Netherlands East Indies was the equivalent of 1912 tons of fine tin in February. Shipments of Straits tin in February amounted to 3430 tons of which 1090 tons were from Singapore and 2340 tons were from Penang. The United States received 2250 tons in February and 1300 tons in January.

**COPPER** — Inquiry for April copper, for which order books were opened recently, continues in excess of expected supplies for that month. Producers are still allocating supplies to customers and in most instances these allotments are below amounts requested. While the domestic market holds steady, sales in the export market have been made up to 22.00c, fas New York.

The red metal scrap market displayed strength last week with some brass and bronze ingot makers advancing their bids 1/4 to 1/2-cent above previous levels for composition red brass, auto radiators, heavy yellow brass, rolled brass and brass pipe. Custom smelters report that only small tonnages of scrap are coming out at their bids that range from 18.00c to 18.25c, delivered, for No. 1 copper scrap.

**Consumers continue to seek larger tonnages than producers are able to provide**

**LEAD**—Receipts of lead in ore and scrap by smelters held steady in January at 42,395 tons compared with 42,200 tons in December, according to the American Bureau of Metal Statistics. Domestic receipts of lead in ore declined to 32,019 tons in January from 34,797 tons in December, a drop of 2778 tons which was more than offset by an increase of 3063 tons in receipts of foreign material, totaling 6739 tons in January against 3676 tons in December. Receipts of lead in scrap declined slightly to 3637 tons from 3727 tons in December. Imports of refined lead totaled 13,742 tons in January compared with 20,932 tons in the preceding month.

National Lead Co. has revised its prices, effective as of Mar. 1, to the following levels to jobbers on the basis of fob, Cleveland or Pittsburgh: Drum traps, lead traps and bends, combination ferrules, bends and ferrules, list price plus 42 per cent; lead pipe, 5/8-inch to 6 inches, I.D., 17.60c per 100 lb, for full coils or 10-foot lengths and 17.85c for cut coils and lengths; sheet lead, weighing 2-1/2 pounds or more per square foot, 18.35c per 100 lb for full rolls of 140 square feet or more.

**ZINC** — Smelter production of zinc declined about 4700 tons in February to 66,784 tons, but the daily rate held steady at about 2303 tons. Shipments of slab zinc eased about 2100 tons to 62,503 tons, but the export and drawback shipments dropped to 5893 tons in February from 9670 tons in the preceding month. This brought total deliveries in February to 68,396 tons compared with 84,431 tons in January, the decline being attributed mainly to the transfer of 10,156 tons to the permanent government stockpile in January against no such movement in February.

Stocks of refined zinc on hand at the end of February, including metal held by the Office of Metals Reserve, totaled 53,473 tons, a decline of 1612 tons from the January total. Unfilled orders on producers' books increased 4662 tons during February to a total of 72,224 tons at the monthend, the largest backlog since June, 1942.

# NONFERROUS METAL PRICES

**Copper:** Electrolytic, carloads 21.50c, delivered Conn.; Lake, 21.62½c del. Conn. Dealers may add ¾c for 5000 lb to carload; 1c 1000-4999 lb; 1½c, 500-999 lb; 2c 0-499 lb. Casting, nom., refinery, 20,000 lb or more; nom., less than 20,000 lb.

**Brass Ingot:** 85-5-5-5 (No. 115) 18.50-19.25c; 88-10-2 (No. 215) 28.00c; 80-10-10 (No. 305) 24.25c; No. 1 yellow (No. 405) 14.50-16.00c; carlot prices, including 25c per 100 lb freight allowance; add ¼c for less than carloads.

**Zinc:** Prime western 12.00c, brass special 12.25c, intermediate 12.50c, E. St. Louis; high grade 13.00c, del., carlots. For 20,000 lb to carlots add 0.15c; 10,000-20,000 lb 0.25c; 2000-10,000 lb 0.4c; under 2000 lb 0.50c.

**Lead:** Common 14.80c-14.85c, chemical 14.90c, corroding 14.90c, E. St. Louis for carlots.

**Primary Aluminum:** 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lb and over; add ½c 2000-9999 lb; 1c less through 2000 lb.

**Secondary Aluminum:** Piston alloy (No. 122 type) 16.50-16.75; No. 12 foundry alloy (No. 2 grade) 16.25-16.75c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1 (95-97½%) 16.50-17.00c; grade 2 (92-95%) 16.00-16.50c; grade 3 (90-92%) 15.75-16.00c; grade 4 (85-90%) 15.25-15.50c. Above prices for 30,000 lb or more; add ½c 10,000-30,000 lb; ½c 5000-10,000 lb; ¾c 1000-5000 lb; 1¼c less than 1000 lb. Prices include freight at carload rate up to 75c per 100 lb.

**Magnesium:** Commercially pure (99.8%) standard ingots (4-notch, about 20 lb), 10,000 lb and over, 20.50c, fob Freeport, Tex.; 2000 to 9999 lb, 21.50c; 100 to 1999 lb, 22.50c. Extruded rounds, 12 inches long, 1.312 inches in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb. 42.00-46.00c; 100 to 4000 lb, 35.00-36.00c.

**Tin:** Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lb, 1½c 1000-2239, 2½c 500-999, 3c under 500. Grade A, 99.8% or higher (including Straits), 94.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.05% max. arsenic, 93.85c; Grade C, 99.65-99.79% incl. 93.50c; 99.00-99.64% 93.50c and 98.00-98.99%, 92.60c for tin content.

**Antimony:** American bulk carlots fob Laredo, Tex., 99.0% to 99.8% and 99.8% and over but not meeting specifications below, 33.00c; 99.8% and over (arsenic, 0.05% max.; other impurities, 0.1% max.) 33.50c. On producers' sales add ¼c for less than carload to 10,000 lb; ½c for 224-999 lb; add 2c for 223 lb and less; on sales by dealers, distributors, and jobbers add ½c, 1c, and 3c, respectively.

**Nickel:** Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked 33.75c lb; 25 lb pigs produced from electrolytic cathodes 35.25c lb; shot produced from electrolytic cathodes 36.25c lb; "F" nickel shots or ingots for addition to cast iron 34.25c lb. Prices include import duty.

**Mercury:** Open market, spot, New York, $76-$78 per 76-lb flask.

**Beryllium-Copper:** 3.75-4.25% Be, $20.50 per lb contained Be.

**Cadmium:** Bars, ingots, pencils, pigs, plates, rods, slabs, sticks, and all other "regular" straight or flat forms $1.75 lb, del.; anodes, balls, discs and all other special or patented shapes, $1.80.

**Cobalt:** 97-98%, $1.65 lb for 550 lb (keg) $1.67 lb for 100 lb (case); $1.72 lb under 100 lb.

**Gold:** U. S. Treasury, $35 per ounce.

**Silver:** Open market, N. Y., 74.62½c, per ounce.

**Platinum:** $72-$75 per ounce.

**Palladium:** $24 per troy ounce.

**Iridium:** $95-$105 per troy ounce.

## Rolled, Drawn, Extruded Products

Copper and brass product prices are fob mill, with freight prepaid on 200 lb or more.

**Sheet:** Copper 33.68c; yellow brass 30.16c; commercial bronze, 95% 33.80c, 90% 33.27c; red brass, 85% 32.23c, 80% 31.70c; best quality 31.09c; Everdur, Duronze, Herculoy or equiv., hot-rolled, 38.56c; nickel silver, 18%, 42.42c; phosphor bronze, grade A, 5%, 52.70c.

**Rods:** Copper, hot rolled 30.03c, cold drawn 31.03c; yellow brass, free cutting, 24.69c; commercial bronze, 95% 33.49c, 90% 32.96c; red brass, 85% 31.92c, 80% 31.39c; best quality 30.78c.

**Seamless Tubing:** Copper 33.72c; yellow brass 32.92c; commercial bronze 90% 35.68c; red brass 85% 34.89c, 80% 34.36c; best quality brass 33.50c.

**Wire:** Yellow brass 30.45c; commercial bronze, 95% 34.09c, 90% 33.56c; red brass, 85% 32.52c, 80% 31.99c; best quality brass 31.38c.

**Copper Wire:** Bare, soft, fob eastern mills, carlots 26.80c, less carlots 27.30c; weatherproof, fob eastern mills, carlots 27.35c, less carlots 27.85c; magnet, delivered, carlots 29.75c-31.13c, 15,000 lb or more 30.00c-31.38c, less carlots 30.50c-31.88.

**Aluminum Sheets and Circles:** 2s and 3s mill finish; base price, cents per pound, 30,000 lb or more, bulk or skid packing, fob shipping point. Transportation allowance: Actual transportation charges not exceeding the rail freight rate applicable to shipments of 30,000 lb are deducted on shipments of 500 lb or more.

| Thickness Range, Inches | Widths or Diameters, In., Incl. | Flat Sheet Base* | Coiled Sheet Base | Coiled Sheet Circle† Base |
|---|---|---|---|---|
| 0.249-0.136 | 12-48 | 24.0 | ... | ... |
| 0.135-0.126 | 12-48 | 24.5 | ... | ... |
| 0.125-0.096 | 12-48 | 24.5 | 23.1 | 26.3 |
| 0.095-0.077 | 12-48 | 25.0 | 23.2 | 26.5 |
| 0.076-0.061 | 12-48 | 25.5 | 23.4 | 26.7 |
| 0.060-0.048 | 12-48 | 25.7 | 23.6 | 27.0 |
| 0.047-0.038 | 12-48 | 26.1 | 23.8 | 27.3 |
| 0.037-0.030 | 12-48 | 26.4 | 24.1 | 27.7 |
| 0.029-0.024 | 12-48 | 26.8 | 24.4 | 28.1 |
| 0.023-0.019 | 12-36 | 27.4 | 24.8 | 28.6 |
| 0.018-0.017 | 12-36 | 27.9 | 25.3 | 29.3 |
| 0.016-0.015 | 12-36 | 28.6 | 25.9 | 30.1 |
| 0.014 | 12-24 | 29.4 | 26.6 | 31.1 |
| 0.013-0.012 | 12-24 | 30.2 | 27.3 | 32.0 |
| 0.011 | 12-24 | 31.1 | 28.1 | 33.1 |
| 0.010-0.0095 | 12-24 | 32.1 | 29.0 | 34.3 |
| 0.009-0.0085 | 12-20 | 33.2 | 30.0 | 35.7 |
| 0.008-0.0075 | 12-20 | 34.4 | 31.1 | 37.1 |
| 0.007 | 12-18 | 35.7 | 32.3 | 38.8 |
| 0.006 | 12-18 | 37.0 | 33.5 | 42.6 |

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

**Lead Products:** Prices to jobbers, fob Cleveland, Pittsburgh: Sheets, full rolls, 140 sq ft or more, 18.35c per cwt.; add 50c per cwt., 10 sq ft to 140 sq ft; $1.25, less than 10 sq ft; $1, circles and segments.
Pipe: Full coils, 17.60c per cwt; cut coils, 17.85c.
Lead Traps and Bends: List price plus 42%.

**Zinc Products:** Sheet, 16.50c-17.00c, fob mill, 36,000 lb and over. Ribbon zinc in coils, 15.25c-16.00c, fob mill, 36,000 lb and over. Plates, not over 12-in., 14.25c; over 12-in., 15.25c.

## Plating Materials

**Chromic Acid:** 99.75%, flake, fob Philadelphia, carloads, 22.00c; 5 tons and over 22.50c; 1 to 5 tons, 23.00c; less than 1 ton, 23.50c.

**Copper Anodes:** Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 30.59c; oval, 30.09c; electrodeposited, 29.84c; cast, 29.59c.

**Copper Carbonate:** 52-54% metallic Cu; 50 lb bags, 25.00c fob Cleveland.

**Copper Cyanide:** 70-71% Cu, 100-lb drums, 45.00c fob Cleveland.

**Sodium Cyanide:** 96-98%, ½-oz ball, in 200 lb drums, 1 to 400 lb, 16.00c, 500 lb and over, 15.00c, fob Cleveland.

**Nickel Anodes:** Rolled oval, carbonized, carloads, 48.00c; 10,000 to 30,000 lb, 49.00c, 3000 to 10,000 lb, 50.00c; 500 to 3000 lb. 51.00c; 100 to 500 lb, 53.00c; under 100 lb, 56.00c; add 1 cent for rolled depolarized.

**Nickel Chloride:** 100-lb kegs, 23.50c; 275-lb, or 500 bbls. 21.50c, fob Cleveland.

**Tin Anodes:** Bar, 1000 lb and over 110.00c; 500 to 1000 lb, 110.50c; 200 to 5000 lb, 111.00c; less than 200 lb, 112.50c; ball, 1000 lb and over, 112.25c; 500 to 1000 lb. 112.75c; 200 to 500 lb, 113.25c; less than 200 lb, 114.75c, fob Sewaren, N. J.

**Tin Chloride:** Fob Grasselli, N. J., 625 lb bbls., price on application.

**Sodium Stannate:** 25 lb cans only, less than 100 lb, to consumers and resellers, 67.4c; 100 or 300 lb drums only, 100 to 500 lb, to consumers 59.2c, to resellers 54.8c; 600 to 1900 lb, to consumers 56.8c, to resellers 52.5c; 2000 to 9900 lb, to consumers 55.0c, to resellers 50.9c; 10,000 lb or more l.c.l., to consumers 53.9c, to resellers 49.9c; carloads, to consumers 52.7c, to resellers 48.7c. Prices fob Sewaren, N. J.

**Zinc Cyanide:** 100-lb drums 36.00c, fob Cleveland or Detroit; 35.00, fob Philadelphia.

## Scrap Metals

### BRASS MILL ALLOWANCES

(Based on 21.50c, Conn., for copper)
Prices for less than 15,000 lb fob shipping point. Add ½c for 15,000-40,000 lb; 1c for 40,000 or more.

| | Clean Heavy | Rod Ends | Clean Turnings |
|---|---|---|---|
| Copper | 19.125 | 19.125 | 18.375 |
| Yellow brass | 15.625 | 15.375 | 14.750 |
| Commercial Bronze | | | |
| 95% | 18.125 | 17.875 | 17.375 |
| 90% | 17.625 | 17.375 | 16.875 |
| Red brass | | | |
| 85% | 17.500 | 17.250 | 16.750 |
| 80% | 17.250 | 17.000 | 16.500 |
| Best Quality (71-79%) | 16.625 | 16.375 | 15.875 |
| Muntz Metal | 14.750 | 14.500 | 14.000 |
| Nickel silver, 5% | 16.500 | 16.250 | 8.250 |
| Phos. bronze, A. B. | 20.750 | 20.500 | 19.500 |
| Naval brass | 15.250 | 15.000 | 14.500 |
| Manganese bronze | 15.250 | 15.000 | 14.375 |

### BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 17.50, No. 2 copper 16.50, light copper 15.50, composition red brass 14.25, auto radiators 11.25, heavy yellow brass 10.25-10.50, brass pipe 11.25.

### REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 18.00-18.25, No. 2 copper 17.00-17.25, light copper, 16.00-16.25, refinery brass (60% copper), per dry copper content 15.75.

### DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

**Copper and Brass:** Heavy copper and wire No. 1 16.00-16.50, No. 2 15.00-15.50, light copper 14.00-14.25, No. 1 composition red brass 11.50-12.00, No. 1 composition turnings 11.00-11.50, mixed brass turnings 7.00-7.25, new brass clippings 12.50-13.00, No. 1 brass rod turnings 10.00-10.50, light brass 6.00-6.25, heavy yellow brass 8.25-8.50, new brass rod ends 10.50-11.00, auto radiators, unsweated 9.25-9.50, cocks and faucets 9.25-9.50, brass pipe 9.00-9.25.

**Lead:** Heavy 13.50-14.00, battery plates 7.25-7.50, linotype and stereotype 14.50-15.00, electrotype 12.00-12.50, mixed babbitt 13.50-14.00, solder joints 16.50-17.00.

**Zinc:** Old zinc 5.50-5.75; new die cast scrap 4.75-5.25, old die cast scrap 2.75-3.25.

**Tin:** No. 1 pewter 60.00-62.00, block tin pipe 77.00-78.00, auto babbitt 45.00-47.00, No. 1 babbitt 45.00-48.00, siphon tops 45.00-47.00.

**Aluminum:** Clippings 2S 9.00-9.50, old sheets 7.00-7.50, crankcases 7.00-7.50, borings and turnings 2.50-3.00, pistons, free of struts, 6.00-6.50.

**Nickel:** Anodes 16.00-17.00, turnings 12.50-13.00, rod ends 16.00-17.00.

**Monel:** Clippings 12.00-12.50, turnings 7.00-7.25, old sheets 10.00-10.50, rods 10.00-10.50, castings 9.00.

## DAILY PRICE RECORD

| | Copper | Lead | Zinc | Tin | Aluminum | Antimony | Nickel | Silver |
|---|---|---|---|---|---|---|---|---|
| January Average: | 21.500 | 14.825 | 11.056 | 94.000 | 15.000 | 33.000 | 33.750 | 74.625 |
| Feb. Average .. | 21.500 | 14.825 | 12.000 | 94.000 | 15.000 | 33.000 | 33.750 | 74.625 |
| Mar. 1-11 ..... | 21.500 | 14.80–14.85 | 12.000 | 94.000 | 15.000 | 33.000 | 33.750 | 74.625 |

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, fob Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

# OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

### PITTSBURGH

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $40.00-40.50* |
| No. 2 Heavy Melt. Steel | 40.00-40.50* |
| No. 1 Busheling | 40.00-40.50* |
| Nos. 1, 2 and 3 Bundles | 40.00-40.50* |
| Machine Shop Turnings | 36.00-36.50 |
| Mixed Borings, Turnings | 36.00-36.50 |
| Short Shovel Turnings. | 37.00-37.50 |
| Cast Iron Borings | 37.00-37.50 |
| Bar Crops and Plate | 47.50-48.00 |
| Low Phos. Steel | 47.50-48.00 |
| Heavy Turnings | 40.00-40.50 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola | 61.00-62.00 |
| Charging Box Cast | 45.00-47.00 |
| Heavy Breakable Cast. | 46.00-47.00 |
| Unstripped Motor Blocks | 52.00-53.00 |
| Malleable | 69.00-70.00 |
| Brake Shoe | 52.00-53.00 |
| Clean Auto Cast | 58.00-59.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 41.00-41.50 |
| R.R. Malleable | 75.00-80.00 |
| Axles | 51.50-52.00 |
| Rails, Rerolling | 56.00-57.00 |
| Rails, Random Lengths | 53.00-54.00 |
| Rails, 3 ft and under | 57.50-58.50 |
| Rails, 18 in. and under | 58.50-59.50 |
| Railroad Specialties | 54.00-55.00 |
| Uncut Tires | 52.00-52.50 |
| Angles, Splice Bars | 53.00-54.00 |

*Plus applicable freight spring-board.

### CLEVELAND

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $39.50-40.00* |
| No. 2 Heavy Melt. Steel | 39.50-40.00* |
| No. 1 Busheling | 39.50-40.00* |
| Nos. 1 & 2 Bundles | 39.50-40.00* |
| Machine Shop Turnings | 34.50-35.00 |
| Mixed Borings, Turnings | 34.00-36.00 |
| Short Shovel Turnings. | 35.50-36.00 |
| Cast Iron Borings | 35.50-36.00 |
| Bar Crops and Plate | 44.50-45.00 |
| Punchings & Plate Scrap | 44.50-45.00 |
| Heavy Turnings | 39.50-40.50 |
| Alloy Free Turnings | 37.50-38.50 |
| Cut Structurals | 46.00-49.00 |

*Plus applicable freight spring-board.

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola | 70.00-72.00 |
| Charging Box Cast | 60.00-62.00 |
| Stove Plate | 60.00-62.00 |
| Heavy Breakable Cast. | 56.00-58.00 |
| Unstripped Motor Blocks | 60.00-62.00 |
| Malleable | 75.00-80.00 |
| Brake Shoes | 54.00-55.00 |
| Clean Auto Cast | 70.00-72.00 |
| No. 1 Wheels | 60.00-62.00 |
| Burnt Cast | 58.00-59.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 40.50-41.50* |
| R.R. Malleable | 75.00-80.00 |
| Rails, Rerolling | 57.00-58.00 |
| Rails, Random Lengths | 56.00-57.00 |
| Rails, 3 ft and under | 61.00-63.00 |
| Cast Steel | 56.00-58.00 |
| Railroad Specialties | 53.00-55.00 |
| Uncut Tires | 56.00-57.00 |
| Angles, Splice Bars | 59.00-60.00 |

*Plus applicable freight spring board.

### VALLEY

| | |
|---|---|
| No. 1 Heavy Melt. Steel | 40.00-40.50* |
| No. 2 Heavy Melt. Steel | 40.00-40.50* |
| No. 1 Bundles | 40.00-40.50* |
| Machine Shop Turnings | 34.50-35.50 |
| Short Shovel Turnings. | 36.50-37.00 |
| Cast Iron Borings | 36.00-36.50 |
| Low Phos. | 46.00-47.50 |

*Plus applicable freight spring-board.

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 40.50-41.50* |

*Plus applicable freight spring board.

### MANSFIELD

| | |
|---|---|
| Machine Shop Turnings | $35.00-35.50 |
| Short Shovel Turnings. | 37.00-37.50 |

### CINCINNATI

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $39.50 |
| No. 2 Heavy Melt. Steel | 39.50 |
| No. 1 Busheling | 39.50 |
| No. 1 Bundles | 39.50 |
| No. 2 Bundles | 39.50 |
| Machine Shop Turnings | 33.50 |
| Mixed Borings, Turnings | 32.50 |
| Short Shovel Turnings. | 35.50 |
| Cast Iron Borings | 34.50 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 55.00 |
| Charging Box Cast | 43.00 |
| Heavy Breakable Cast. | 50.00 |
| Stove Plate | 47.00 |
| Unstripped Motor Blocks | 45.00 |
| Brake Shoes | 45.00 |
| Clean Auto Cast | 55.00 |
| Drop Broken Cast | 60.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 40.50 |
| R.R. Malleable | 68.00 |
| Rails, Rerolling | 53.00 |
| Rails, Random Lengths | 50.00 |
| Rails, 18 in. and under | 60.00 |

### DETROIT

(Dealers buying prices, fob shipping point)

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $35.00-35.50 |
| No. 1 Busheling | 35.00-35.50 |
| Nos. 1 & 2 Bundles | 35.00-35.50 |
| No. 3 Bundles | 35.00-35.50 |
| Machine Shop Turnings | 29.00-29.50 |
| Mixed Borings Turnings | 29.00-29.50 |
| Short Shovel Turnings. | 30.00-30.50 |
| Cast Iron Borings | 30.00-30.50 |
| Punchings & Plate Scrap | 40.00-40.50 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 60.00-62.00 |
| Heavy Breakable Cast. | 50.00-52.00 |
| Clean Auto Cast | 62.00-65.00 |

### BUFFALO

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $43.00-45.00 |
| No. 2 Heavy Melt. Steel | 39.75-40.25 |
| No. 1 Busheling | 39.75-40.25 |
| No. 1 & 2 Bundles | 39.75-40.25 |
| Machine Shop Turnings | 35.25-36.75 |
| Mixed Borings, Turnings | 35.25-36.75 |
| Cast Iron Borings | 36.25-36.75 |
| Short Shovel Turnings. | 36.25-36.75 |
| Low Phos. | 46.00-47.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola | 60.00-62.00 |
| Mixed Cupola | 58.00-60.00 |
| Heavy Breakable Cast. | 55.00-57.00 |
| Malleable | 70.00-75.00 |
| Clean Auto Cast | 62.00-64.00 |

Railroad Scrap

| | |
|---|---|
| Rails, 3 ft. and under. | 56.00-58.00 |
| Railroad Specialties | 52.00-53.00 |

### PHILADELPHIA

| | |
|---|---|
| No. 1 Hvy. Melt. Steel | $41.50 |
| No. 2 Hvy. Melt. Steel | 39.00 |
| No. 1 Busheling | 39.00 |
| No. 1, No. 2 Bundles | 39.00 |
| No. 3 Bundles | 37.00 |
| Machine Shop Turnings | 34.00-35.00 |
| Mixed Borings, Turnings | 34.00-35.00 |
| Short Shovel Turnings. | 34.00-35.00 |
| Bar Crop and Plate | 44.50-45.50 |
| Punchings & Plate Scrap | 44.50-45.50 |
| Cut Structurals | 44.50-45.50 |
| Elec. Furnace Bundles | 43.50-44.50 |
| Heavy Turnings | 42.50-43.00 |
| No. 1 Chemical Borings | 42.00-43.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 64.00-65.00 |
| No. 1 Machinery Cast. | 66.00-67.00 |
| Charging Box Cast | 60.00-61.00 |
| Heavy Breakable Cast. | 60.00-61.00 |
| Unstripped Motor Blocks | 61.50-62.50 |
| Malleable | 74.00-76.00 |
| Clean Auto Cast | 64.00-65.00 |
| No. 1 Wheels | 65.00-66.00 |

### NEW YORK

(Brokers buying prices, fob shipping point)

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $34.03 |
| No. 2 Heavy Melt. Steel | 34.03 |
| No. 1 Busheling | 34.03 |
| Nos. 1 & 2 Bundles | 34.03 |
| No. 3 Bundles | 32.03 |
| Machine Shop Turnings | 28.50-29.00 |
| Mixed Borings, Turnings | 28.50-29.00 |
| Short Shovel Turnings. | 30.50-31.00 |
| Punchings & Plate Scrap | 39.00-40.00 |
| Cut Structurals | 39.00-40.00 |
| Elec. Furnace Bundles. | 39.00-40.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 58.00-60.00 |
| Charging Box Cast | 55.00-57.00 |
| Heavy Breakable | 55.00-57.00 |
| Unstripped Motor Blocks | 52.00-54.00 |
| Malleable | 68.00-69.00 |

### BOSTON

(Fob shipping point)

| | |
|---|---|
| No.1 Heavy Melt. Steel | $31.40-31.90 |
| No. 2 Heavy Melt. Steel | 31.40-31.90 |
| No. 1 Bundles | 31.40-31.90 |
| No. 1 Busheling | 31.40-31.90 |
| Machine Shop Turnings | 26.90 |
| Mixed Borings, Turnings | 27.00-28.00 |
| Short Shovel Turnings. | 28.90 |
| Bar Crops and Plate | 37.00 |
| Punchings & Plate Scrap | 37.00 |
| Chemical Borings | 34.00-35.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 55.00-60.00 |
| Heavy Breakable Cast. | 53.00-55.00 |
| Stove Plate | 50.00-52.00 |
| Unstripped Motor Blocks | 40.00-41.00 |
| Clean Auto Cast | 48.00-50.00 |

### CHICAGO

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $38.00-39.50 |
| No. 2 Heavy Melt. Steel | 37.00-37.50 |
| No. 1 Bundles | 38.00-39.50 |
| No. 2 Bundles | 37.00-37.50 |
| No. 3 Bundles | 35.00-35.50 |
| Machine Shop Turnings | 33.00-34.50 |
| Mixed Borings, Turnings | 33.00-34.50 |
| Short Shovel Turnings. | 35.00-36.50 |
| Cast Iron Borings | 34.00-35.50 |
| Bar Crops and Plate | 45.50-47.00 |
| Punchings | 47.00-48.50 |
| Elec. Furnace Bundles. | 39.00-40.50 |
| Heavy Turnings | 37.50-39.00 |
| Cut Structurals | 43.00-44.50 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 65.00-67.00 |
| Clean Auto Cast | 62.00-65.00 |
| No. 1 Wheels | 53.00-56.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 41.00-41.50 |
| Malleable | 70.00-71.00 |
| Rails, Rerolling | 49.50-50.00 |
| Rails, Random Lengths | 46.50-47.50 |
| Rails, 3 ft and under. | 55.00-56.00 |
| Rails, 18 in. and under | 57.00-58.00 |
| Railroad Specialties | 49.00-50.00 |
| Angles, Splice Bars | 51.00-52.00 |

### ST. LOUIS

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $39.50-40.50 |
| No. 2 Heavy Melt. Steel | 37.50-38.50 |
| Machine Shop Turnings | 32.50-33.50 |
| Short Shovel Turnings. | 34.50-35.50 |

Cast Iron Grades (Fob shipping point)

| | |
|---|---|
| No. 1 Cupola Cast | 65.00-67.00 |
| Mixed Cast | 60.00-62.00 |
| Heavy Breakable Cast. | 53.00-55.00 |
| Brake Shoes | 54.00-55.00 |
| Clean Auto Cast | 64.00-66.00 |
| Burnt Cast | 58.00-59.00 |

Railroad Scrap

| | |
|---|---|
| R.R. Mealleable | 65.00-70.00 |
| Rails, Rerolling | 50.50-52.50 |
| Rails, Random Lengths | 49.50-51.50 |
| Rails, 3 ft and under | 54.00-56.00 |
| Uncut Tires | 46.00-47.00 |
| Angles, Splice Bars | 46.00-48.00 |

### BIRMINGHAM

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $37.00 |
| No. 2 Heavy Melt. Steel | 37.00 |
| No. 1 Busheling | 37.90 |
| Nos. 1 & 2 Bundles | 37.00 |
| No. 3 Bundles | 31.00 |
| Long Turnings | 24.50 |
| Short Shovel Turnings. | 26.00-27.00 |
| Cast Iron Borings | 25.00 |
| Bar Crops and Plate | 38.50 |
| Cut Structurals | 38.50 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 51.00 |
| Stove Plate | 43.00 |
| No. 1 Wheels | 45.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 38.00 |
| R.R. Malleable | 45.00 |
| Axles, Steel | 39.00 |
| Rails, Rerolling | 52.00 |
| Rails, Random Length. | 39.00 |
| Rails, 3 ft and under | 41.00 |
| Angles and Splice Bars | 41.00 |

### SAN FRANCISCO

| | |
|---|---|
| No. 1 Heavy Melt. Steel | *$25.00 |
| No. 2 Heavy Melt. Steel | *25.00 |
| No. 1 Busheling | *25.00 |
| Nos. 1 & 2 Bundles | *25.00 |
| No. 3 Bundles | *20.00 |
| Machine Shop Turnings | *15.50 |
| Bar Crops and Plate | 25.00 |
| Cast Steel | 25.00 |
| Alloy Free Turnings | 15.50 |
| Cut Structurals | 25.00 |
| Tin Can Bundles | 20.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 Heavy Melting | 26.00 |
| Axles | 32.00 |
| Rails, Random Lengths | 26.50 |
| Uncut Tires | 33.50 |

* Fob California shipping point.

### SEATTLE

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $24.00 |
| No. 2 Heavy Melt. Steel | 24.00 |
| No. 1 Busheling | 24.00 |
| Nos. 1 & 2 Bundles | 22.00 |
| No. 3 Bundles | 22.00 |
| Machine Shop Turnings | 14.50 |
| Mixed Borings, Turnings | 14.50 |
| Punchings & Plate Scrap | 24.50 |
| Cut Structurals | 24.50 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 40.00 |
| Charging Box Cast | 25.00 |
| Heavy Breakable Cast. | 24.00 |
| Stove Plate | 25.50 |
| Unstripped Motor Blocks | 24.00 |
| Malleable | 30.00 |
| Brake Shoes | 30.00 |
| Clean Auto Cast | 30.00 |
| No. 1 Wheels | 26.50 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 22.00 |
| Railroad Malleable | 30.00 |
| Rails, Random Lengths | 21.50 |
| Angles and Splice Bars | 23.00 |

### LOS ANGELES

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $25.00 |
| No. 2 Heavy Melt. Steel | 25.00 |
| Nos. 1 & 2 Bundles | 25.00 |
| Machine Shop Turnings | 16.00 |
| Mixed Borings, Turnings | 15.50-16.00 |
| Punchings & Plate Scrap | 28.00 |
| Elec. Furnace Bundles. | 28.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 35.00-36.00 |

### HAMILTON, ONT.

(Ceiling prices, delivered)

| | |
|---|---|
| Heavy Melting | $22.00 |
| No. 1 Bundles | 22.00 |
| Mechanical Bundles | 20.00 |
| Mixed Steel Scrap | 19.00 |
| Mixed Borings, Turnings | 17.00 |
| Rails, Remelting | 28.00 |
| Rails, Rerolling | 26.00 |
| Bushelings | 17.00 |
| Bushelings, new factory, prep'd | 21.00 |
| Bushelings, new factory, unprep'd | 16.00 |
| Short Steel Turnings | 17.00 |

Cast Iron Grades*

| | |
|---|---|
| No. 1 Cast | 42.00-48.00 |
| No. 2 Cast | 35.00-37.00 |

* Removed from price control Aug. 9, 1947; quoted on basis of fob shipping point.

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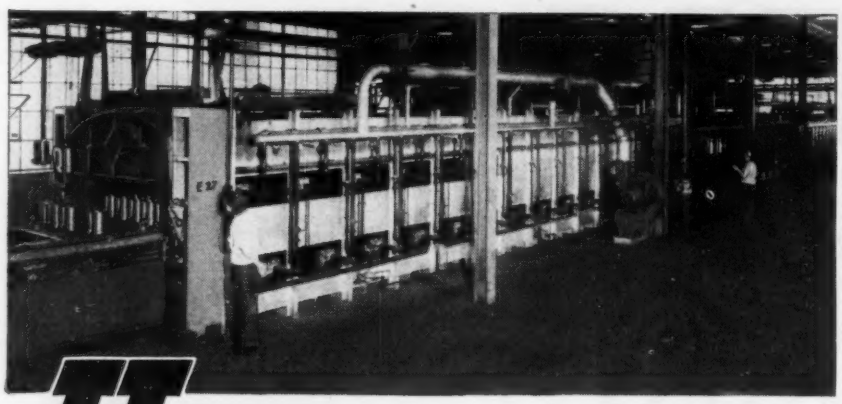

A side view of the Hagan Automatic Heat Treating Unit

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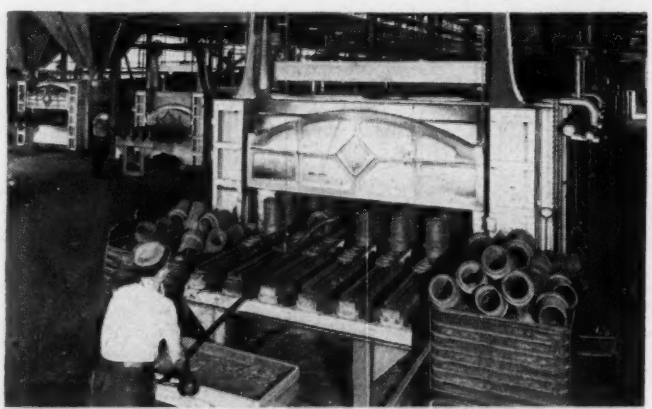
The discharge end of the Draw Furnace of the Hagan Automatic Heat Treating Unit showing the treated product emerging.



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## Sheets, Strip . . .

### High-priority programs seen as sustaining tight supply situation

Sheet Prices, Page 146

**New York** — Stringency in hot and cold sheets, galvanized sheets and enameling stock appears as pronounced here as ever. While consumers are hoping that better operating conditions in the second quarter may make for some slight increase in second quarter receipts, including arrearages, they are concerned over the possibility of priority tonnage to some industries other than their own having an adverse effect. They are also speculating on the possibility of a sharp upturn in domestic defense requirements before many more weeks roll by, which might limit their own receipts. Admittedly, sheets and strip would be less affected by such requirements than the heavier products, but in view of the already tight situation, they would have a noticeable effect, nevertheless. So far, steel producers have noticed no pick up in defense requirements, despite the increasingly serious international situation.

**Boston** — Dual and multiple delivered prices on more steel products have grown out of unequal increases in base prices, revisions in extras and changes in basing points. Narrow cold-rolled low-carbon strip is being sold at three prices on a Worcester base and, while the bulk of tonnage moves at 3.75c, one producer is charging 3.95c for heavier gages while another is quoting 4.45c on this grade. Sheet prices are more uniform, but there are differences remaining after one leading seller equalized with competition on several grades on which a $2 spread prevailed for some months.

**Pittsburgh** — Sellers of flat-rolled products are closely watching order books for "hold ups" on delivery of significant tonnages to manufacturers of home appliances and other semi-durable goods. It is believed that consumers inventory pipe lines are in better balance with projected production schedules, while increased competition reported in some household appliance lines indicates a leveling off in production schedules of these items over coming months. However, most consumer goods manufacturers contend their production schedules continue limited by availability of steel and components. Sheet and strip producers report no easing in pressure for prompt deliveries. Expanded finishing mill capacity should make possible increased sheet and strip output through the latter half of this year However, it is questionable to what extent the semifinished steel supply situation will permit full utilization of flat-rolled steel facilities at capacity over the coming months.

**Chicago** — While sheet and stripmakers report no lessening in demand for their products, customers pressing as insistently as even for more tonnage and faster shipments each week contribute more evidence that inventories of manufactured goods are growing, pipelines are being filled and consumer demand is declining. If this trend continues, it is only a mat-

ter of time until the condition creeps up to mill level. A slight slackening of conversion tonnage is discernible, and it has been reported that several interests are actively trying to "sell" slabs for conversion Heretofore, buyers have sought out sources of supply. In view of the easing demand for consumer goods, which in time will be reflected in production schedules, it is understandable that manufacturers are not likely to reduce or cancel out sheet and strip tonnage with mills until forced to do so. Higher prices could be in the offing and it could be money in the pocket to acquire all available tonnage now and cancel later in the year if necessary.

**Cleveland**—Thomas Steel Co., Warren, O., increased its prices on coated strip 15c per hundred pounds, from $3.55 to $3.70, Mar. 1. The company quotes the $3.70 price on the following basing points, Warren, Cleveland, Youngstown, and Pittsburgh. Approximately 80 per cent of the company's business is in coated strip.

**Cincinnati**—Sheet mills in this district find no shading in demand, hence allotments for second quarter will fall short, as heretofore, in meeting all needs. There are, however, some examples of cutbacks by fabricators who had extraordinary postwar booms but this tonnage is minor and has no effect on the overall situation. Price schedules of district mills are unchanged.

**St. Louis** — This district's sheet output is rapidly falling behind under difficulties experienced by Granite City Steel Co. in adjusting its new cold reduction mill. It has reached 40 per cent of full rolling speed but capacity is not expected before May or June. Company's books were opened for February and March but those orders may not be delivered before June. Second quarter books therefore will either open late or not at all. Open-hearth output as a consequence has been held down, officials preferring not to sell excess ingots. Some are being laid on the ground. Sheet demand is unabated, with prospects the saturation point will be felt in the East first, since only about three eastern mills are shipping in here now as compared to the prewar 15. Steel fabricators here profess to see unlimited demand for their products. Mills are reporting a scarcity of machinists and yard labor.

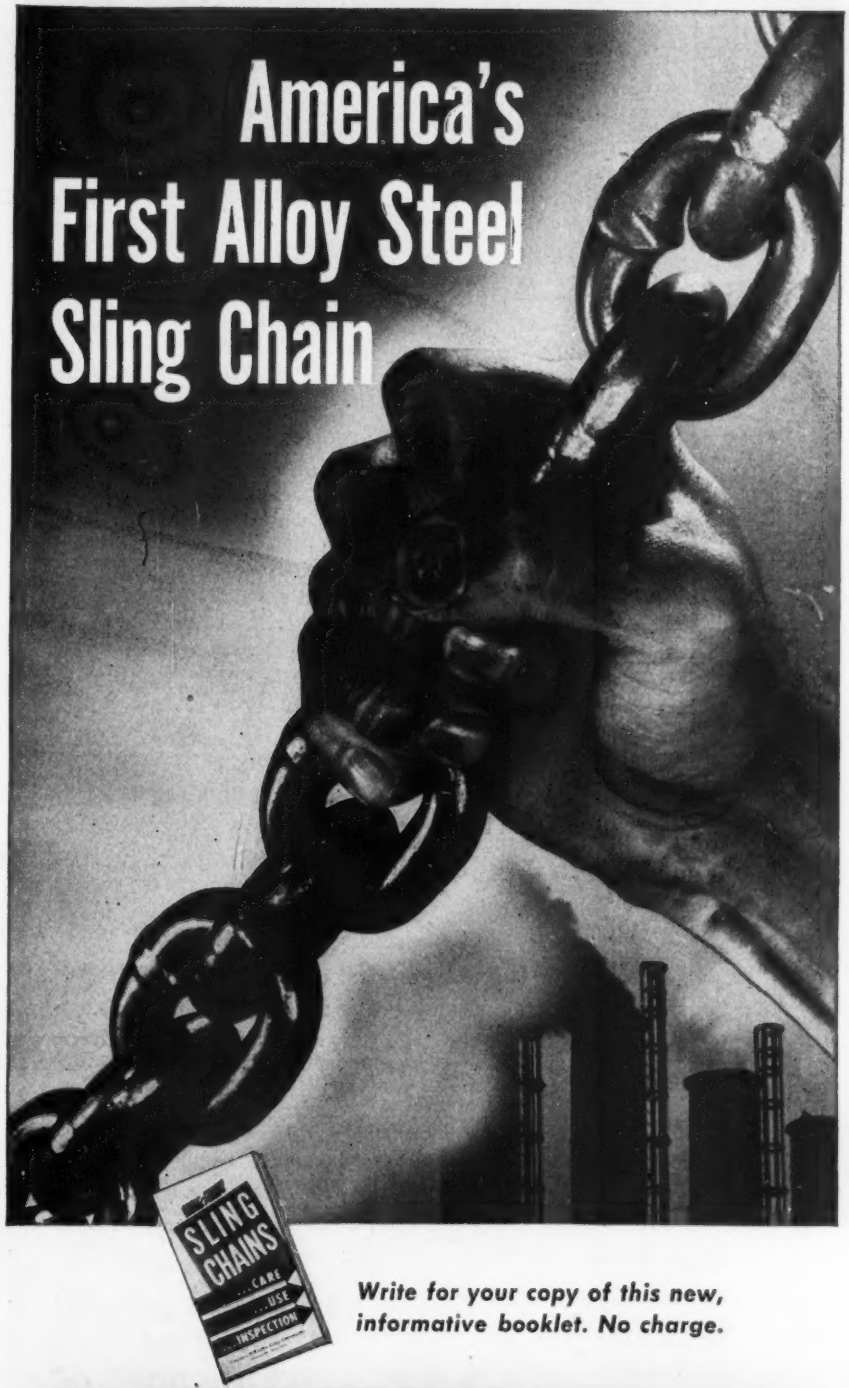
## Gray Market Fosters Hijacking of Steel

**Chicago**—Gray market has given rise to hijacking of steel being shipped from mill to consumer by truck. Several instances of this kind have occurred in this area in recent months.

A man was convicted in federal court here last week of stealing a truck and trailer loaded with 46,635 pounds of cold-rolled sheets from the yards of the Willett Co., a Chicago trucking concern. The load had been consigned from Carnegie-Illinois Steel Corp., Gary, Ind., to the Hub Stamping Co., Chicago.

According to the assistant U. S. attorney, the convicted man sold the steel to a sheet metal company for $1300. It was resold immediately to an Indiana Harbor, Ind., broker for $3300 and resold again to a company in Hamilton, O., for $4100. Mill price of the sheets was said to be only $2200.


CM HERC-ALLOY

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## Steel Bars . . .

Bar Prices, Page 146

**New York** — Apart from stronger demand for alloy and cold-drawn carbon bars, there is no appreciable change in the bar situation. Pressure for hot alloy bars appears as active as ever, with little fluctuation in demand. Most consumers are hoping to receive somewhat more tonnage in the second quarter than in the current quarter, because of likely improved mill operating conditions; however, they look for arrearages to make up the difference, as new quotas are no larger, if as large, than those announced for the first quarter.

Industries which stand to benefit under the proposed allocation program are more hopeful than the others, but even this program may not get under way rapidly enough to have much bearing on second quarter distribution. Railroad equipment priority requirements for the next three months may crystallize fairly soon, but there is more question about the other three industries or so that are expected to come in for extra consideration, and it appears that in any event preferred consumers will have to put up a strong case for whatever extra tonnage they may receive. The European Recovery Plan is not expected to make any extra demands on steel for direct export, although it may create an indirect burden through manufactured products that are expected to be exported under this plan.

Improved demand for alloy bars is ascribed principally to expanding automotive requirements, although sellers assert there is a livelier trend in miscellaneous consumption as well.

**Boston** — Although there is some easing in carbon bars and cold-drawn inventories are generally in better balance, overall demand is some sizes, notably flats and bar shapes, is ahead of supply. The freight car building program is cutting deeper into carbon bar allotments for the second quarter and some quotas have been reduced 15 to 20 per cent. Cold-finished stock is in heavier demand by the manufacturers of screw machine parts while hot-rolled open-hearth alloys have extended to July and August in some instances. Extension in electric furnace grades are less pronounced. Forge shops are taking up full allocations of carbon bars and in numerous instances are seeking additional tonnage. Carbon bar requirements are now estimated at three-to-one over alloys. While the bulk of bar tonnage coming into this territory is based at Buffalo, numerous sizes and grades produced at Buffalo are based fob at the mill producing the material. Considerable bessemer, for instance, is based at Youngstown and Pittsburgh. On stainless bars, most sellers meet the Watervliet, N. Y., base only on sizes and grades produced at that point, otherwise billing on the producing point.

**Chicago** — Barmakers in this district continue to report strong demand for carbon bars, with consumers seeking more tonnage and accepting alloy bars as a substitute when necessary In no sector of industry is diminishing demand observed, although faint clues begin to drift in of declining demand for consumer goods.

## Plates . . .

Plate Prices, Page 147

**New York** — Plate consumers report little improvement in supply, and while they are hoping to receive more tonnage in the second quarter on the assumption that there will be some improvement in production, they estimate that it will continue to fall well short of requirements. This is particularly true of light gage tonnage. It is estimated that most mills will require at least one month's full production to enable them to work off tonnage due consumers in the first quarter. Seasonal conditions in the first quarter have caused mills to fall behind on their commitments.

Standard Oil Co. of New Jersey recently placed orders for two more large tankers, making a total of six 2600-ton vessels now under contract. The latest tankers will be built by the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., along with two others. The remaining two under contract are already under construction in the Chester, Pa., yards of the Sun Shipbuilding & Dry Dock Co., where seven similiar vessels for use by the Socony-Vacuum Oil Co. and two for the Gulf Oil Corp. are also under construction.

The new orders will increase to 21 the number of tankers that will be on American ship ways this year. Among other tankers on order are four 18,000-ton tankers for Greek interests now being built by the Bethlehem Steel Co.'s Sparrows Point yard and two 30,000-ton tankers for the National Bulk Carriers under contract with the Welding Ship Yards, Norfolk, Va.

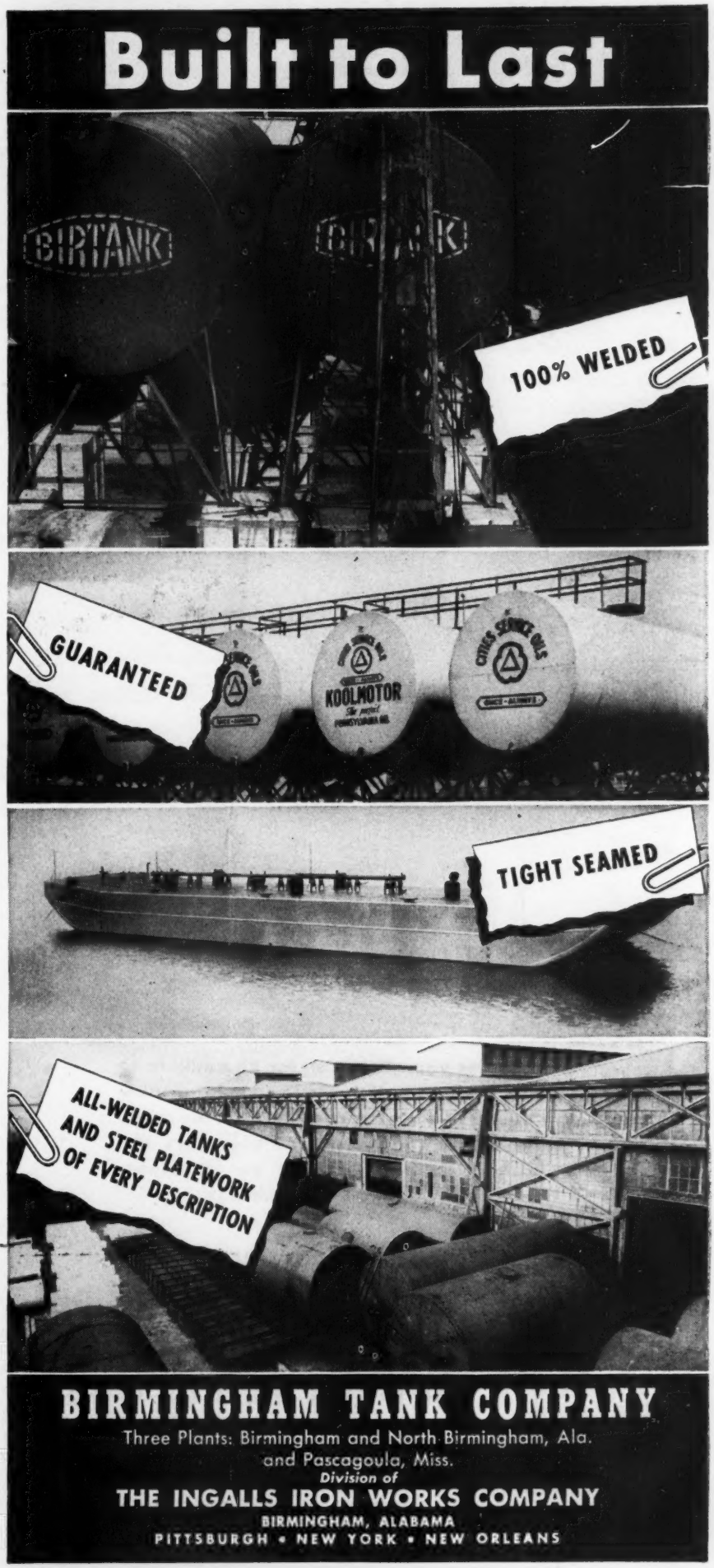
The American tanker fleet is the world's largest, according to Merchant Marine Institute, being twice the size of its nearest rival, the British. Norway, Panama, Holland, Sweden, France, Italy, Argentina and Russia own the world's top ten tanker fleets. The American tonnage represents 45.62 per cent of the world's total.

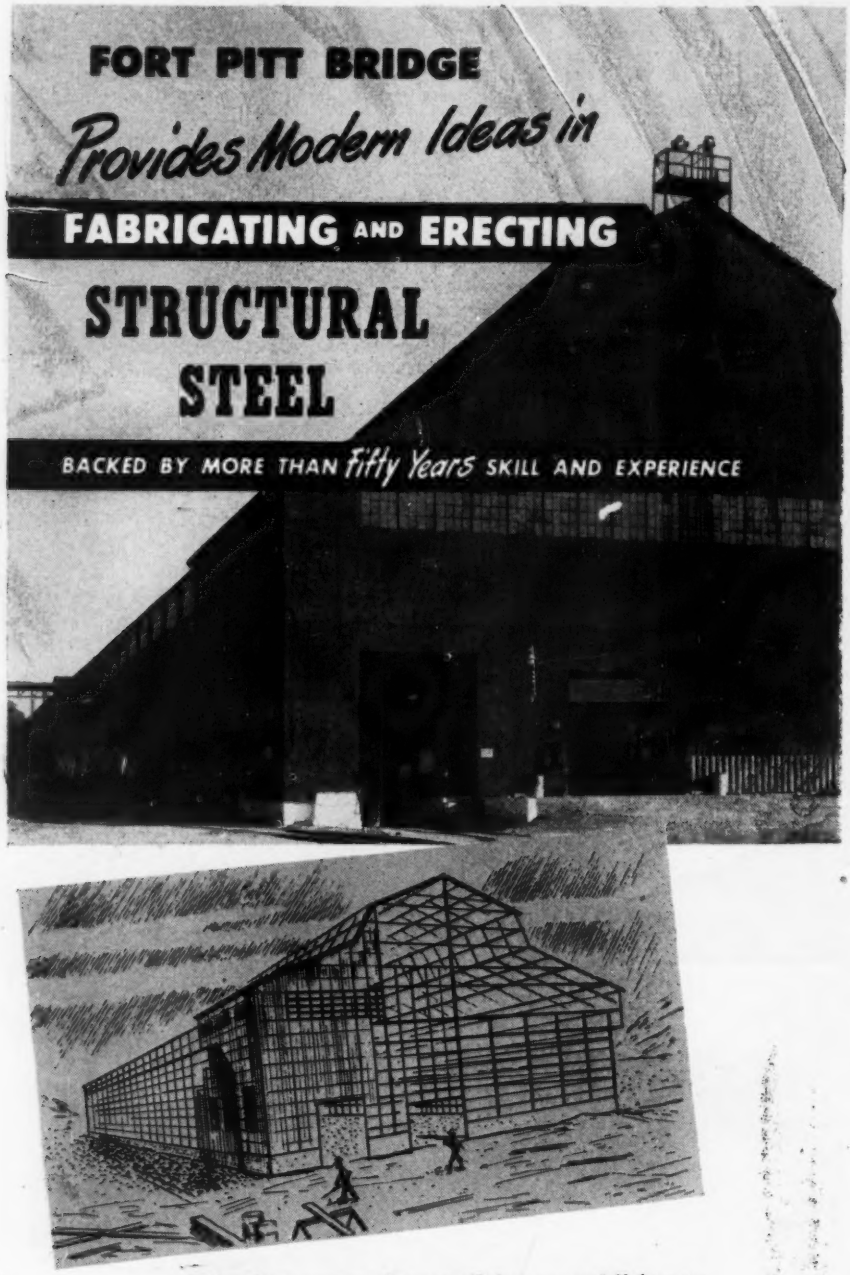
**Philadelphia** — Plate production is being stepped up slightly as a result of a better flow of scrap, but still falls well short of potential capacity. Most producers are behind a month and more on current commitments and refuse much new tonnage.

## Tin Plate . . .

Tin Plate Prices, Page 147

**Pittsburgh** — With but few exceptions, tin mill products production schedules were well sustained during the recent period of industrial gas shortage. Despite relatively stable output at near capacity levels, there are no indications of any easing in pressure for increasing mill allotments. In fact, consumers' inventories are well below normal. A record demand for containers of all types is indicated for 1948 food pack and other end uses and an increase in quarterly export quotas is indicated during the final half of this year. Mills' projected production schedules have not been materially disturbed by recent amendments to the container conservation order M-81. The new coating limitations apparently were anticipated by can companies in establishing specifications for second quarter delivery.



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## Tubular Goods . . .

### Lapweld pipe prices rise $1 to $2 a ton due to change in pricing policy

Tubular Goods Prices, Page 147

**Cleveland** — Special discount to jobbers on electric weld pipe furnished in lieu of lap weld was discontinued Mar. 8 by Republic Steel Corp. The special discount had been one-half of one per cent, or $1 a ton. Similarly, another producer is understood to have discontinued special discount of one-half of one per cent to jobbers on seamless pipe accepted in place of electric weld. Only a small proportion of total pipe tonnage is said to be affected by these moves inasmuch as the bulk goes directly to big consumers.

To compensate for two weeks' production lost because of industrial gas curtailments this winter, Republic Steel has combined its April and May quotas on standard pipe and for that two-month period is accepting orders equivalent to only 1-1/2 months' output. Because the gas curtailments occurred too late for March orders to be held down, the company is making the adjustment in the April-May period. Insufficiency of steel has reduced Republic's line pipe production from 20 to 16 turns a week, and if the steel supply does not improve it may be necessary to reduce output of standard pipe from the present 20 turns a week.

**Pittsburgh** — National Tube Co. discontinued the practice on Feb. 19 of selling seamless pipe at the lapweld discount price basis to former jobbers and distributors of the latter item. Similar action is expected to be taken by Youngstown Sheet & Tube Co. on Apr. 1 on sales in areas outside of Indiana Harbor. These price actions are said to involve only an insignificant portion of total mill pipe output in each instance. The price increase resulting from this change in pricing policy is said to range from $1 to $2 per ton.

**Boston** — Delivered prices on seamless pipe are spread from $1 to $11 a ton on 2 to 3-1/2-inch sizes, one producer advancing quotations in that size range higher than others. Pressure and mechanical tubing deliveries have lengthened while demand for merchant steel pipe is unabated with consumer requirements higher against low distributor inventories. Pipe fabricators are booked through this year and are offered business for next year in excess of the probable production of pipe in that period. Hot-rolled mechanical tubing in popular sizes is now quoted for October delivery; cold-drawn, for August and September. Unsatisfied with allotments and prospects, utilities are pressing hard for additional steel pipe with small success. April and May quotas to distributors have been reduced 25 per cent in some instances at a time when seasonal peak demand is likely.

**Seattle** — Cast iron pipe market is quiet. Inquiry is limited to small projects since no large jobs are up for figures at present. A housing project on Mercer Island, near Seattle, calls for 150 tons pipe, bids soon.

## Structural Shapes . . .

Structural Shape Prices, Page 147

**New York** — Structural activity still remains somewhat sluggish. Awards are scattered and new inquiry is not picking up in any appreciable degree from a month ago. While most fabricators have good backlogs, they are nevertheless showing increasing interest in work now coming out and in certain instances appear to be making quite a drive for tonnage. The principal factor in the present lull appears to be uncertainty as to when costs will stabilize: in fact, some builders are in the mood at present to await a general decline in costs rather than simply a leveling off. Private work appears to be more affected by this uncertainty than public work.

**Philadelphia** — Structural demand continues spotty, with building cost factors weighing heavily. Various projects are being held up temporarily, pending further clarification as to trends. However, most structural shops still have good backlogs.

**Seattle** — Aside from a project involving about 1000 tons of shapes and special fabrication for Bonneville Power Administration, on which some plants cannot bid, no major structural tonnages are pending.

## Bolts, Nuts . . .

Bolt, Nut, Rivet Prices, Page 147

**Cleveland** — Railroad freight car building program is providing a substantial amount of business for rivet producers. One company, while its participation in the car building program has been an aid in obtaining steel, is hopeful that rivets soon will be officially classified as a component part for freight cars, thereby possibly resulting in the channeling of more steel to rivet makers. Demand, although slackened, continues for ship rivets for tanker repairs. Backlog of orders for rivets generally is as large as it was a year ago.

Champion Rivet Co. announced its second quarter price schedule will be the same as that for the first quarter.

## Reinforcing Bars . . .

Reinforcing Bar Prices, Page 146

**Boston** — Inquiry for concrete reinforcing bars is heavier and well in excess of supply. Fabricators and distributors are held to allocations and are peddling out tonnage sparingly. On numerous projects they are not quoting.

**Seattle** — Several important construction projects in this area involving sizable tonnages of reinforcing bars are up for bids in the immediate future or are pending. Meanwhile local plants are swamped with requests for small tonnages required for schools, small commercial buildings and general construction. Northwest Steel Rolling Mills, Seattle, is rolling on a reduced schedule of four days a week due to the shortage of ingots and unsatisfactory scrap resulting in fewer charges per day. This condition has reduced production about 500 tons monthly. Rolling mills are in position to be selective in accepting new business which continues in large volume, much of it in small lots.


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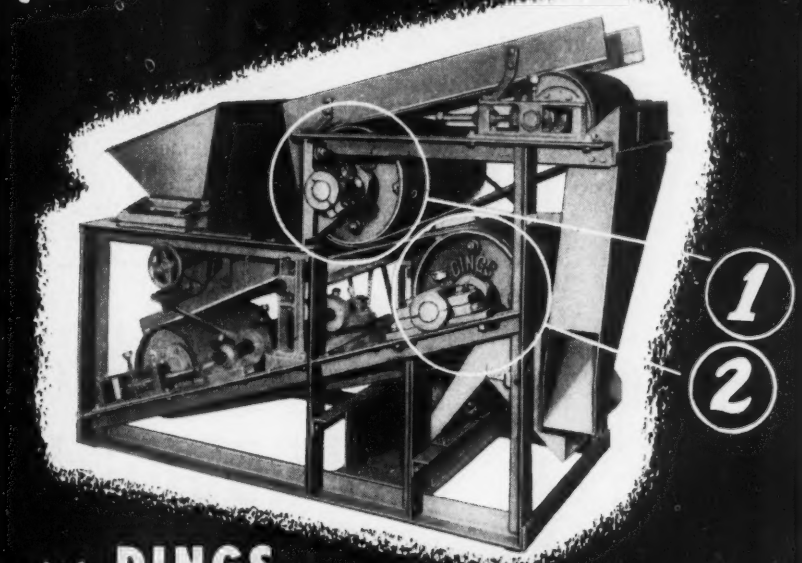


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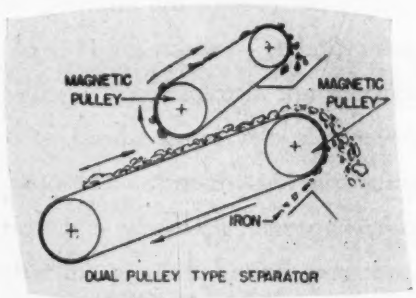

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# Lack of Steel Slows Wire Mills

**American Steel & Wire Co. cuts rod and wire production at Cleveland to four-day week. Company's Chicago operations may be similarly affected. Relief not expected before June**

**Cleveland**—Acute shortage of semi-finished steel has forced a reduction of rod and wire mill operations from a five-day to four-day week at two Cleveland plants of American Steel & Wire Co., second largest subsidiary of United States Steel Corp.

Possibility is seen that the wire company's Chicago operations may be similarly affected.

At Cleveland, the work-week of approximately 2000 employees of the wire company's Cuyahoga and American Works has been shortened. Relief from this shortage is not expected before June 1.

The shortage affecting the Cleveland plants stems from interruptions to blast furnace output at the Lorain, O., works of another of U. S. Steel's subsidiaries, the National Tube Co., where a multimillion dollar expansion and rehabilitation program is under way. This interruption to pig iron production in turn curtailed production of steel billets which the Lorain facility has furnished American Steel & Wire for processing into rod and wire.

At American Steel & Wire's Chicago operations which are also partially dependent on National Tube for steel, inventories of steel are dwindling and the wire company likely will have to consider cutting its production unless it can get increased tonnages of steel from another of its suppliers, Carnegie-Illinois Steel Corp., largest subsidiary of U. S. Steel.

Cold rolling of strip at the Cleveland plants of American Steel & Wire is not affected by the curtailments in the rod and wire mills.

Demand for wire and its products continues to run well ahead of output. One product, upholstery wire, is in particularly heavy demand largely because of a high rate of production in the automobile industry, a big user of upholstery. Also in heavy demand are nails, barb wire and woven wire fence.

Prospects for relief in its present semifinished stringency are not promising for American Steel & Wire in view of the policy of U. S. Steel to take care of nonaffiliated customers even at the expense of its own subsidiaries. Actually, the difficulty in which the wire company finds itself gives emphasis to the statement of Benjamin F. Fairless, president, U. S. Steel Corp., testifying Mar. 2 before the Joint Congressional Committee on the Economic Report in its investigation of the recent $5 per ton increase in semifinished steel prices.

At that hearing Mr. Fairless pointed out that U. S. Steel's subsidiary, Carnegie-Illinois Steel Corp., its largest producer of semifinished steel, was losing approximately $5 per ton on such products sold to some 75 customers, ten of which account for 80 per cent of Carnegie's sales of this material. In such circumstances, he said, U. S. Steel had the alternative of either raising the price to permit at least an even break on sales, or abandon marketing of such items entirely, using the steel for production of the corporation's own finished steel products. In fairness to the small nonaffiliated steel mills and forge shops depending on the corporation for semifinished, Mr. Fairless said it was decided to raise the price sufficiently to enable the corporation to service these companies.

In adopting such policy the corporation apparently committed itself to serving these customers even when its own subsidiaries are being forced to curtail operations because of lack of raw steel. This would seem to be clearly reflected in curtailment of operations at the Cuyahoga and American Works in Cleveland, since order volume on the books of American Steel & Wire is understood to be so great as to warrant six or seven-day week operation.

**Boston** — Demand for bed spring wire is lighter, but most high-carbon grade schedules are filled through the second quarter with a substantial volume of orders awaiting scheduling. All types of heading wire are under pressure. For screw manufacture, users are hampered by the lack of balance in inventories, notably in the


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smaller and intermediate sizes. Buying of resulphurized wire is well maintained. Most users are taking full quotas, the few exceptions being those with shortages of other materials which curtail their operations. Rod supply is limited and is the key factor in limiting output of numerous low-carbon grades.

**Pittsburgh** — Output of manufacturers' and merchant wire products is back to normal following the February curtailment. During the period of industrial gas shortage the overall production was fairly well sustained, although finishing operations on some grades were adverely affected. This has necessitated minor revisions in second quarter product mix in respect to the various wire classifications. Tight wire situation shows no sign of abating, while actual shortages of wire rods continue to restrict output of nonintegrated interests.

## Large Order Placed for Cast Steel Car Wheels

**Cleveland** — West Steel Casting Co., this city, has received an order from the Jones & Laughlin Steel Corp., Pittsburgh, for 22,400 cast steel mine car wheels, to be delivered over a period of about one year, for use on new design cars to be installed in their mine consolidation program at Vestaburg, Pa.

## Rails, Cars . . .

**Track Material Prices, Page 147**

**New York** — Domestic freight car awards in February involved 10,698 units compared with 9213 in the preceding month, and 13,727 in the corresponding period of last year, according to the American Railway Car Institute. Of last month's total, 5725 were placed with railroad shops and 4973 with commercial car builders.

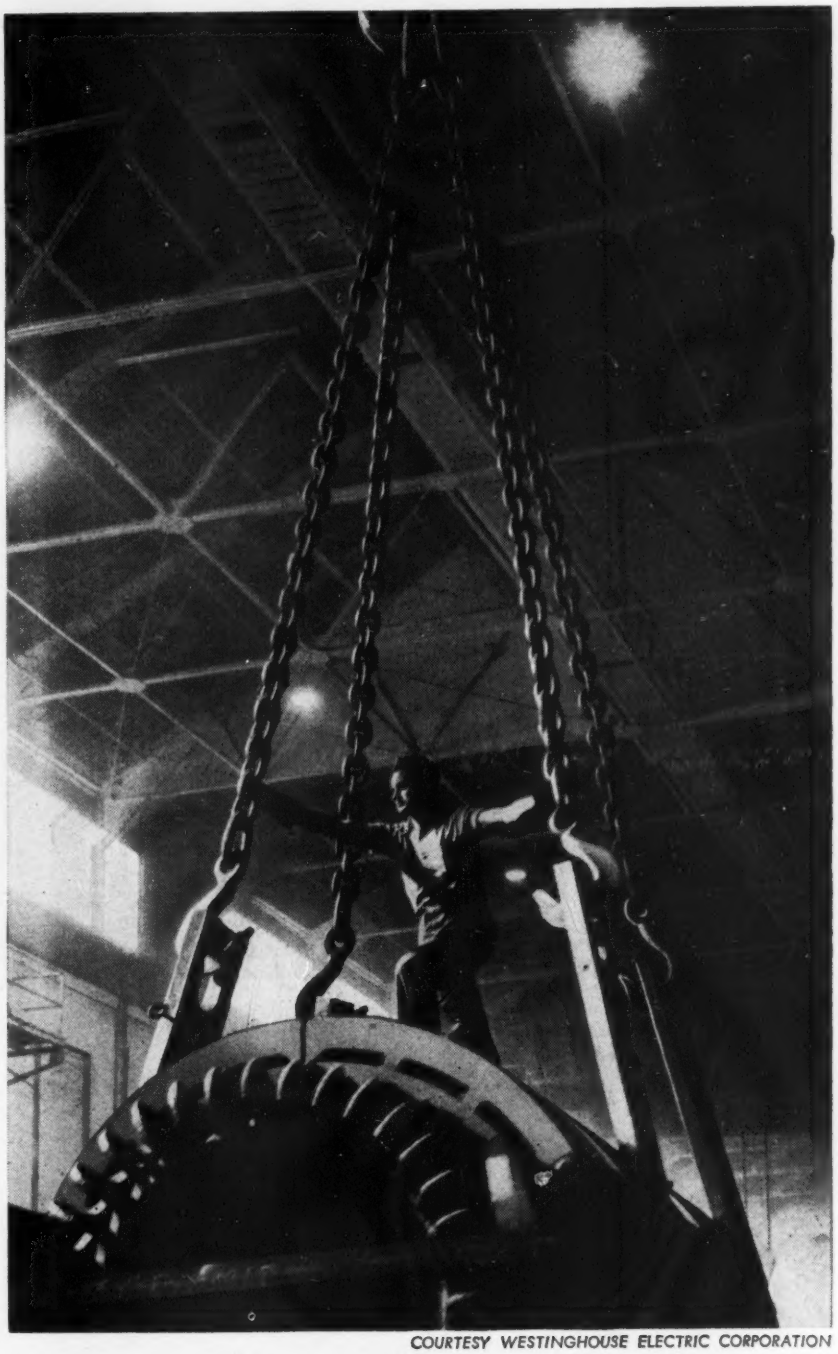
Freight car production in February amounted to 8463 cars, against 2293 in the same month last year. Last month's production included 2175 built by railway shops and 6306 by the car builders.

February deliveries fell below January production of 8949 cars, as a result of severe weather conditions, shutdowns in some plants because of gas shortages and continuing lack of some types of steel.

## Steel Allocation Program May Cover Warehouses

**Washington** — Office of Industry Co-operation is giving consideration to fitting the steel warehouse industry into the voluntary steel allocations program. Nothing definite yet has shaped up but in view of the continued complaints from manufacturers over inability to obtain steel, the possibility of solving the problem of small consumers through co-operation of the steel warehouse industry is being considered by OIC.

The proposal is only in the idea stage at the moment. If any decision is made to act along this line, it is understood the OIC would first appoint a warehouse advisory committee to discuss the plan.



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## Warehouse . . .

Warehouse Prices, Page 149

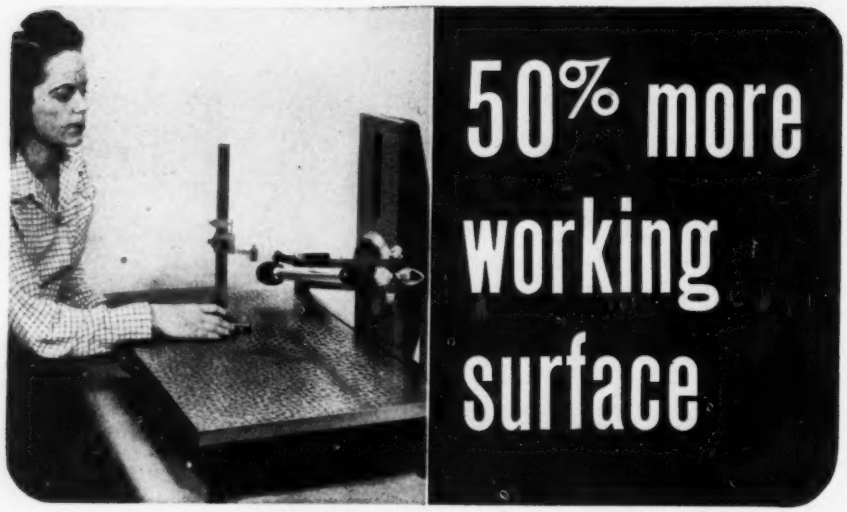
**Philadelphia** — Jobbers here report daily bookings as being well sustained and, in view of the longer month and the fewer holidays, expect March business to surpass that of February. In fact, if buying follows the normal trend, March should be one of the best, if not the best, month this year. Trading in the flat-rolled products and small bars and shapes, continues limited by shipments from the mills, although receipts are at a slightly better rate than earlier in the year.

Demand for hot carbon bars remains active. Some consumers are specifying less heavily due to unbalanced inventories in other lines of steel but in general they are taking all that they can get in the sizes and grades normally required. As is usually the case in bars, demand is diversified. Cold-drawn carbon bars and alloy bars continue to move more freely, although deliveries are not nearly as tight as in the hot carbon grades.

**Cleveland** — Allocations of steel to the railroad freight car program and winter's recent interruptions to steel output have substantially reduced warehouses' receipts of steel products. Meanwhile, jobbers report no easing in demand. Further complicating the supply problem of one warehouse is its inability to get mill delivery on its orders for bar flats. Rather than lose tonnage that it otherwise would get in bar flats this warehouse is converting its bar flat orders into orders for equivalent tonnage in rounds.

**Cincinnati** — Warehouse sales are being adversely affected by declining mill shipments. In the early postwar period plates were readily available, but now they have joined sheets in the category of hard-to-get items. Reinforcing steel has disappeared from inventories, and little structural steel is appearing on the jobber market.

**Seattle** — Wholesale jobbers report a steady volume for all items. Reinforcing bars, plates, wire, nails, pipe and sheets are still in critical supply. Shipments of these items as a rule go directly to the job, consequently inventories are low and badly broken. No improvement in the short items is in sight. While there is some gray market in other critical items, plates and sheets appear to be the principal premium items, most offers coming from unknown Los Angeles brokers.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## Iron Ore . . .

Iron Ore Prices, Page 148

**Cleveland** — Mine shipments of Lake Superior iron ore by railroads to upper lake ports and all rail increased 18,656,773 tons last year to a total of 79,685,143, according to the Lake Superior Iron Ore Association. Included in the 1947 total were 77,878,998 tons shipped to upper lake ports and 1,806,145 tons shipped by the all-rail route.

Shipments from Minnesota ranges totaled 63,517,190 tons, including 620,115 tons of manganiferous ore, from the following ranges: Mesaba, 59,079,371 tons, including 11,489 tons of manganiferous ore; Vermillion, 1,429,595 tons; Cuyuna, 2,860,437 tons, including 608,626 tons of manganiferous ore; and 147,787 tons from Fillmore county. Shipments from Michigan and Wisconsin ranges, totaled 14,463,628 tons, from the following ranges: Gogebic, 5,252,955 tons, Marquette, 5,543,126 tons, and Menominee, 3,667,548 tons. This made total shipments from United States ranges 77,980,818 tons compared with 59,587,730 tons in 1946.

Shipments from Canadian districts increased to 1,704,325 tons in 1947 from 1,440,640 tons in 1946 and included 497,724 tons from Michipicoten and 1,206,601 tons from Steep Rock.

Beneficiation of Lake Superior ore (produced at plants in the mining districts only) continued to increase. The total beneficiated from Minnesota ranges amounted to 16,690,342 tons, or 26.28 per cent of total ore shipped, against 11,850,917 tons, or 23.7 per cent, in 1946; from Michigan-Wisconsin ranges, 45,806 tons, or 0.32 per cent, compared with 31,354 tons, or 0.33 per cent, in 1946; total from United States ranges, 16,736,148 tons, or 21.46 per cent in 1947, compared with 11,882,271 tons, or 19.94 per cent in 1946. From Canadian districts, 496,285 tons, or 29.12 per cent, were beneficiated compared with 552,056 tons, or 38.32 per cent in 1946. This brought the total for United States and Canada to 17,232,433 tons, or 21.63 per cent, compared with 12,440,327 tons, or 20.38 per cent in 1946; 15,990,031 tons, or 20.77 per cent, in 1945; 15,502,149 tons, or 18.83 per cent in 1944; and 15,904,756 tons, or 18.4 per cent in 1943.

## Manganese Ore. . .

**New York** — While manganese ore can still be obtained at 65.00c to 67.00c per unit, duty paid, at Atlantic and Gulf ports, for 48-50 per cent material, a strong undertone still prevails. Sentiment has been further strengthened by the imposition by the Indian government of an export tax of 20 rupees on all manganese shipped after Mar. 1. With the rupee holding at around 30.22 cents, this means an increase of $6.05 per ton.

Indian shipments for some time past have been light, due primarily to transportation difficulties between mines and the ports and to the unsettled political situation. This tax will tend further to restrict shipments from India, thus throwing greater pressure on producers in South Africa and Russia. Shipments from Russia have been steady for some months.

## Pig Iron . . .

Pig Iron Prices, Page 148

**Pittsburgh** — Scarcities of cast scrap and pig iron continue major factors clouding production outlook for foundries in this area. Easing in industrial gas shortage has made possible some improvement in foundry operations, although the effect of this situation on operating schedules was ameliorated by the fact that many foundries had installed stand-by fuel equipment for just such an emergency. Pig iron supply is expected to become tighter over coming months, particularly for those foundries not participating in pending "preferred" allocations for key consuming interests. Both producers and consumers oppose disruption of the present pig iron distribution pattern.

**New York** — Little or no improvement is noted in pig iron supply, district foundries generally operating on a limited basis. Coke also is a restricting factor, some consumers declaring that shortage of this material is proving more of a choke point than that of pig iron. They doubt if milder weather conditions will have much bearing on coke supply before next month. Consumers also see little possibility of any material easing in pig iron supply this month. When it does develop, they look for it to come indirectly because of a better flow of scrap rather than directly because of an actual increase in production of iron.

**Boston** — Slight, if any, improvement in pig iron supply is indicated until more steelworks iron is available. At the moment, with steelworks operations at current levels, prospects are dim. Meanwhile, users of foundry iron are forced to maintain a high ratio of scrap in melts with the bulk of shops depending on the Everett furnace for tonnage.

**Philadelphia** — Little improvement is noted in pig iron shipments, although better movement in steel scrap is relieving some of the pressure on basic. Cast grades of scrap appear about as tight as ever, with prices still climbing and to a point where some consumers regard them as almost prohibitive. Nevertheless, most foundries continue to sustain operations at a fairy modest rate by the judicious use of alloys and close attention to the chemical specifications in all materials used.

While the new 1800-ton blast furnace at Sparrows Point, Md., is scheduled to go in blast around the end of this month, at least one furnace there is scheduled to blow out for repairs as soon as the new stack starts production.

**Cleveland** — Foundries continue to press for shipments of pig iron in an effort to increase the amount of iron in their melts to more normal proportions. Consequently, the excess of demand over supply shows no decrease. In many foundries pig iron is said to constitute only 25 per cent of the melt, and in some it is reported as low as 10 per cent.

Although foundrymen are still handicapped by stringent coke supplies, one coke producer thought the current slight easing in demand for castings might ease somewhat the pressure for deliveries of coke.

**Chicago** — Pig iron and coke supply, either singly or combined, continue to hamper foundry operations in this district. Castings makers have no choice but to gear melting to the availability of raw materials. Of the district's 41 blast furnaces, 38 are in production, the remaining three being down for relining and repairs.

**Buffalo**—Foundries, operating on a curtailed basis, are finding little relief as the pig iron market remains tight. Any prospects for easement in the situation in the near future appears closely tied to an early opening of navigation. Recently overall output

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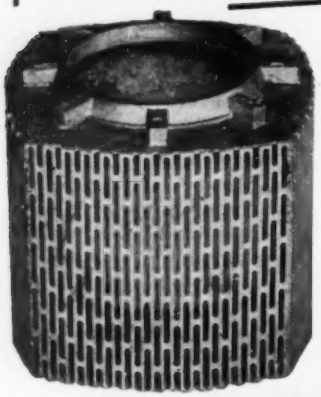

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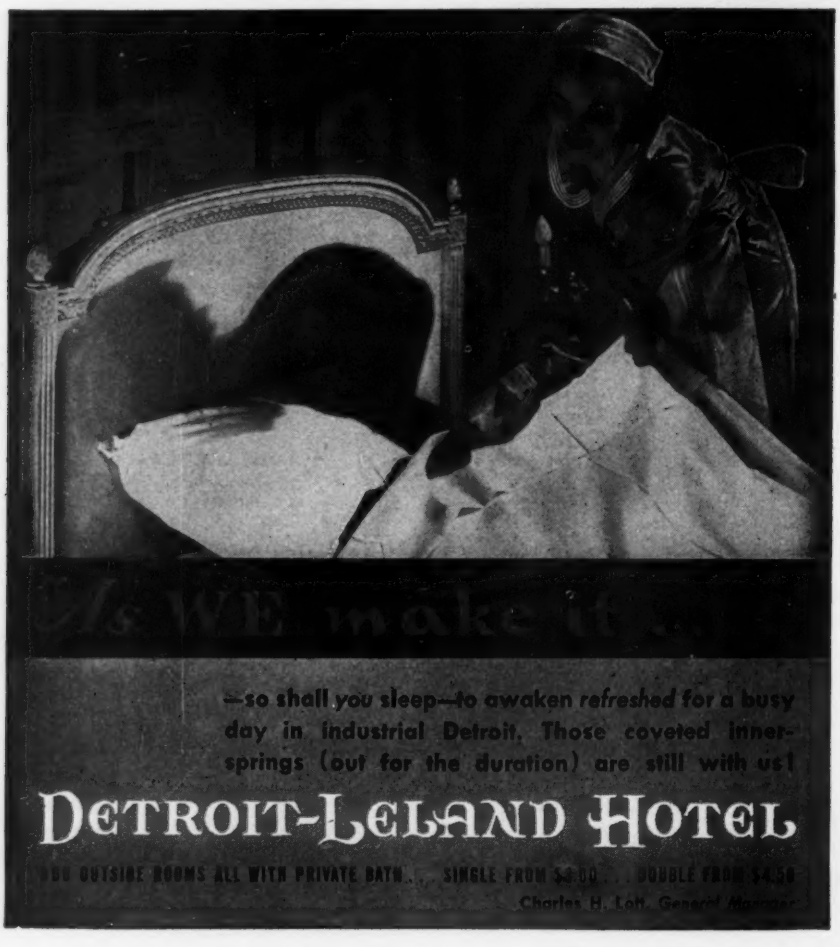
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has been off slightly due to inadequate supplies of raw materials. Blast furnace operations in this district have held at a high level through the winter and a pinch in raw materials is a distinct possibility if the reopening of the navigation season is late. Some operators are now reported near the bottom of their reserve stone stocks.

Final negotiations are reported under way for a resumption of operations at the plant at Dunkirk Foundries Inc., Dunkirk, N. Y., which has been idle since June, 1947. The Knowles-Fisher Corp. is slated to take over the Dunkirk plant.

**St. Louis** — For the first time in many months, there are signs of a probable easing in the extreme pressure on pig iron. It is not here yet, particularly since shutdowns of some Chicago furnaces have sent their customers to the St. Louis district seeking fill-in tonnage. But there are reports that improving scrap shipments are reducing the pig ratio in melts; that a few iron consumers are doing a little stockpiling despite efforts of pig producers to discourage the practice; that the drop in demand from stove manufacturers may be more than a seasonal trend, and that some foundries are catching up on backlogs and are being forced to hustle for new business. Disputing these indications, however, is increased pressure from farm equipment makers and from foundries which have streamlined operations and production in anticipation of coming competitive conditions in the trade.

## Scrap . . .

Scrap Prices, Page 152

**Boston** — Rapid advance in cast iron scrap appears to have been halted, at least temporarily, with more consumers refusing to pay better than $60 delivered for No. 1 cupola cast. Some users are balking at that figure. Inventories of cast scrap have improved due to the heavier movement of these grades recently.

**New York** — Brokers' buying prices on all steel grades of scrap continue unchanged, although charging box and heavy breakable cast appear easier at $55 to $57, fob shipping point.

**Philadelphia** — While some of the larger consumers of open-hearth scrap are taking in all they can get at formula levels, others are not pressing too hard at the moment. The latter appear to have a few weeks backlog.

A Harrisburg, Pa., mill is buying some scrap for open-hearth consumption at $37.50, delivered, as compared with $38 recently, and sentiment in the Philadelphia district generally is a little softer, particularly with milder weather in prospect. However, No. 1 heavy melting steel is unchanged at $41.50 delivered, based on shipments of prime material for Phoenixville, Pa. Some low phos material is said to be moving to that point, although at what premium cannot be ascertained at the moment.

Short shovel turnings are now moving at $34 to $35, delivered, on a parity with machine shop turnings and mixed borings and turnings, and the principal low phos grades are down 50 cents a ton, with bar crop and

plate, punchings and plate scrap and cut structurals reduced to $44.50 to $45.50, delivered.

Cast grades, on the other hand, are again moving upward. No. 1 cupola is now $64 to $65, delivered; machinery cast, $66 to $67; charging box and heavy breakable, $60 to $61; unstripped motor blocks, $61.50 to $62.50; clean auto cast, $64 to $65; and No. 1 wheels, $65 to $66.

**Buffalo** — Mixed feelings prevail in the scrap market with a ripple of buyers' resistance noted as one of the leading mill consumers withdrew from the market temporarily to await price developments. This consumer, however, is taking shipments against old orders which are mostly for No. 1 heavy melting at prices well above the formula. An additional new sale is reported for No. 2 heavy melting at $39.75, although one mill is endeavoring to shave the bid price 25 cents. Mills are becoming more exacting on quality of shipments as more cars are being rejected. A large number of cars was also rejected by Canadian buyers for lack of quality. A substantial quantity of tin cans was reported in No. 2 bundles moving across the border.

Recent strength in low phos seems to have abated with sales taking place within a range of $44.75 to $50 a ton. Cars were reported moving at the inside figure, which is the formula price.

**Chicago** — Except for earmarked factory scrap, mills in this district remain out of the market and there is no indication as to when buying will be resumed or prices which will be offered. Heavy melting material of factory origin commands the price of $39.50, delivered, with related grades according to formula. Brokers' buying prices hold at $38 to $38.50. So far as can be ascertained, there has been no extension of mill purchases of dealer scrap at $37.50, still leaving unanswered the question of whether a differential between factory and dealer scrap is to be re-established on a permanent basis. Foundries have relaxed buying and the market is somewhat uncertain. Consumers are receiving material against old orders in good volume and in some instances are laying down inventory, thus postponing the date for new buying in volume.

**Cleveland** — With many old orders for steelmaking scrap expiring Mar. 15, that day is viewed as a strategic point in the current scrap market for around that time it is expected to be known whether formula prices will hold or whether the first downward break from it here will occur. Although some old orders continue until the end of March, a sufficient number are said to end Mar. 15 to make it appear likely some new deals will take place.

While the formula price has held at Cleveland on steelmaking grades, there has been considerable conjecture as to what will happen in view of an increased flow of scrap and the recent easing away from the formula price at Chicago.

Reflecting the slightly easier tone in scrap, declines in Cleveland prices last week put rerolling rails at $57 to $58, random length rails at $56 to $57, and rails, 3 ft and under, $61 to $63.

Foundry grades remained unchanged in price, but foundrymen con-


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tinued to show some resistance.

**Detroit** — No appreciable change has developed in scrap over the past week. Prices are holding, and movement of material generally is below normal due to continued cold weather. Slowing of scrap-ingot-finished steel conversion arrangements could throw a fair amount of scrap on the open market, with a depressing tendency on prices.

**Cincinnati**—Scrap prices are softer, although mills and brokers are still maintaining the formula program. A principal factor is the greater facility with which tonnage may be acquired. Cast scrap continues to move at high prices, and here too, quotations fail to show the strength attained earlier this year. Volume shipped is tending to expand, due in part to better weather.

**St. Louis** — This district remains unaffected by easing scrap prices elsewhere, principally because there has not been corresponding improvement in supplies here. Mills are attempting to buy at lower levels, but low inventories compel them to stay in the market and pay whatever is asked. Shipments continue to increase moderately each week, with prospect the climb will be substantial by spring. Melting steel is going at formula prices. Cast grades are holding up better than steel because of continuing pig iron scarcities. Railroad scrap last week sank $1 to $3 on a 500-ton offering by the Wabash.

**Seattle** — Cast iron scrap continues in strong demand, although receipts do not seem to have increased under the recently established price of $40.

## Canada . . .

**Toronto, Ont.** — Production of primary iron and steel shapes in Canada amounted to 272,265 net tons in November compared with 265,600 tons in October and 246,244 tons in November, 1946. November output included 260,993 tons of carbon steel shapes and 11,272 tons of alloy steel shapes. Production figures for November includes the 63,261 tons of steel shapes shipped to producers' own plants, or to other plants in the primary industry for further processing.

Shipments during November of primary iron and steel shapes totaled 208,402 net tons of which 198,130 tons were carbon shapes and 10,272 tons alloy steel shapes; shipments for October amounted to 203,988 tons, including 191,287 tons of carbon and 12,701 tons of alloy shapes.

During the 11 months ending with November, production of primary iron and steel shapes totaled 2,889,489 net tons; shipments for sale totaled 2,177,190 net tons and deliveries to producers' interchange, 721,971 tons, which compares with the following totals for the like period of 1946, production 2,131,739 net tons, shipments for sale, 1,744,714 net tons and producers' interchange, 398,471 tons.

Shipments of primary iron and steel shapes in November included 6,457 tons of semifinished shapes; 18,295 tons of structurals; 18,679 tons of plates; 26,489 tons of rails; 52,789 tons of hot-rolled bars; 11,632 tons of pipes and tubes; 16,912 tons of wire rods; 21,180 tons of black sheets; 6060 tons of galvanized sheets; 8705 tons of castings; and 21,204 tons of other shapes.

Of the amount shipped for sale in November, 38,735 tons went directly to railways and railway car shops; 11,151 tons to pressing, forming and stamping plants; 19,510 tons to merchant trade products; 22,488 tons to building construction; 13,911 tons to the containers industry; 12,161 tons to agricultural equipment; 14,117 tons to the automotive industry; 13,253 tons to machinery plants; 4309 tons to shipbuilding; 6400 tons to mining, lumbering, etc.; and 2811 tons to miscellaneous industries. Wholesalers and warehousing accounted for 31,352 tons and exports for 18,204 tons.

## Mission Reports Huge German Scrap Surplus

(*Continued from Page* 62)

to rubble scrap are the problem of identifying the rightful owner and of inducing the owner to part with the material.

**Captured Enemy Material**—Munitions and implements of war captured from the enemy amount to about 140,000 tons, of which 100,000 tons are in CEM dumps and 40,000 tons remain to be collected. Under U. S. occupation policy, CEM scrap has been turned over to a German corporation for use in the German economy.

In addition to the 140,000 tons officially recognized as CEM, there is a substantial tonnage of material, the status of which has not been determined due to technicalities in the U. S. definition. For example, 19 submarines on the ways at Bremen have not been classified as CEM because they were not paid for by the German Navy.

British policy with respect to CEM has been more comprehensive and includes "booty" scrap. Thus the British seized not only guns and ammunition but also billets in the Hermann Goering Works, intended ultimately for use as munitions.

**Scrap at Dealers' Yards and Mills**—German scrap dealers were able to ship 200,000 tons per month before the war, but now are shipping only 50,000 to 70,000 tons a month.

The German dealer is reluctant to sell material, due to the low state of the reichsmark and the possibility of it being further devalued.

In addition to price and currency problems are those of equipment and manpower. Presses and shears are antiquated and in poor repair. Oxygen, carbide and cutting tools are scarce. Trucking equipment and tires are in adequate supply. Scrap workers are not included in the priority classifications that receive extra food

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allowances and many have left for priority jobs.

Consequently, little scrap is being processed. German steel mills, however, have an adequate supply.

**Recommendations** — The mission suggests vigorous steps be taken to recover scrap in Germany. These Would include: 1. Establishment within the military government of an office to expedite the movement of scrap to consuming points; 2. incentives to induce owners to part with scrap, dealers to process and ship it, and workers to take jobs in scrap yards; 3. an Anglo-American corporation to act as a central purchasing agent, with authority to take over management of any yard not co-operating.

Specifically the mission suggests shipment of all Army-generated scrap to the United States; over-riding policies to permit immediate sale of rubble scrap where title is uncertain; prohibition of sales to German mills with more than a 3-month inventory; prohibitive taxation of scrap in German yards which cannot be processed within 6 months; prohibition of shipments to German yards with stocks that cannot be processed within 6 months; broader definition of CEM, in line with that used by the British.

## Allocation Procedure Charted by OIC

(*Continued from Page* 67)

freight cars, passenger cars, or locomotives. They further agree that any material acquired under the plan will not be used for any other purpose.

Steel and pig iron producers participating have agreed to furnish ODT reports on forms showing the quantities of steel and pig iron shipped monthly under the program. Each car builder will furnish monthly reports showing the quantities and types of steel received from individual mills and the number of cars it constructs each month.

The voluntary plan will be in effect until Mar. 1, 1949, or until such earlier time as the secretary of commerce may designate.

**Petroleum Report Due**—The overdue report on steel requirements for an expanded petroleum program is slated for presentation by National Petroleum Council to a government group headed by Max Ball, Interior Department's Oil & Gas Division head. The report is to be discussed and if adopted in its present form will be turned over to the Commerce Department for study with a view to setting up steel requests un-


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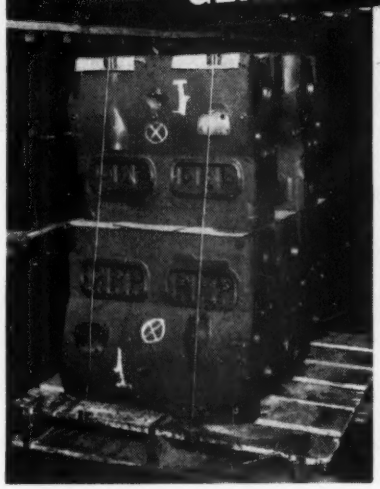

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der the voluntary allocations program.

The report will be made public as soon as revised into final form and it will be must reading for many fabricators of petroleum equipment. In fact it will be full of clues to business opportunities for it will reveal where the equipment and supply shortages are and will identify hundreds of products that must be produced in greater volume from steel. The report is of encyclopedic proportions and represents the first census ever taken of uses of steel in the petroleum field. It covers not only primary requirements in drilling and producing in the field and refining and transportation facilities of all kinds, but it includes also a vast amount of items required in connection with petroleum—as burners for using petroleum, tanks for storing petroleum in homes, factories, dealers and distributors, etc.

Those who compiled the report are worried about one angle which is the extent of the overlapping uses of various products in various consuming fields. An instance of such overlapping is home burners which also come under requirements of the housing field. In other words, a lot of further evaluation work will have to be done before the allocating stage can be reached. Spokesmen for the petroleum industry are unwilling to reveal steel tonnage they propose to request but say it is large though far less than some of the recently published estimates which are labelled as fantastic guesses.

## STRUCTURAL SHAPES . . .

### STRUCTURAL STEEL PLACED

1800 tons, sheet piling, flood wall, Omaha, for U. S. Engineer, to Bethlehem Steel Co., Bethlehem, Pa.; Parsons Construction Co., Omaha, contractor.

1300 tons, power house addition, Pennsylvania Power & Light Co., Sunbury, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

500 tons, Lake Washington canal revetment, Seattle, to Columbia Steel Co., Seattle.

320 tons, apartment, 99th St., between 65th Ave. and 65th Drive, Queens, New York, to Grand Iron Works Inc., New York.

250 tons, Idaho state bridges, to Bethlehem Pacific Coast Steel Co., Seattle.

200 tons, Du Pont plant addition, Belle, W. Va., to Bethlehem Steel Co., Bethlehem, Pa.

200 tons, bulkhead, spec. 2050, Odair, Wash., for Bureau of Reclamation, Denver, to Gunderson Engineering Corp.

175 tons, general storehouse, Department of Public Works, at Vernon Bldg. and 45th Drive, Queens, New York, to Grand Iron Works Inc., New York.

154 tons, bridge, proj. S-0150(1), Eau Claire County, Wis., for state, to Bethlehem Steel Co., Bethlehem, Pa.; L. G. Arnold, Eau Claire, Wis., contractor.

100 tons, hangar, Paine field, Snohomish county, Washington, to Sparling Steel Co., Seattle, low $68,500; fabrication by Standard Steel Fabricating Co., Seattle.

### STRUCTURAL STEEL PENDING

850 tons, fertilizer plant, East St. Louis, Ill.; James Stewart Corp., Chicago, contractor.

840 tons, structural steel in ribs, tunnels and appurtenances, Blakely Mountain dam; bids Mar. 25, U. S. District Engineers, Vicksburg, Miss., inv. 322; work also requires 115 tons steel liner plates.

790 tons, bridge, sec. TF-MFT, Whiteside County, Ill., for county; bids of Feb. 16 rejected.

750 tons, two state bridges, Trenton, N. J.; bids asked.

698 tons, bridge, proj. F, Sterling, Ill., for State Highway Department; Bethlehem Steel Co., Bethlehem, Pa., low; bids Mar. 5.

661 tons, bridge, proj. 42-F, Rockford, Ill., for State Highway Department; American Bridge Co., Pittsburgh, low; bids Mar. 5.

450 tons, state bridge work, Camden county, New Jersey; re-bid with F. A. Canuso & Co., Camden, N. J., again low on general contract.

280 tons, bridge, proj. U-085(34), Douglas county, Wis., for state; bids of Feb. 24 rejected.

275 tons, new plant, Vandercook & Sons, Chicago; postponed indefinitely.

250 tons, private hospital, Williamsport, Pa.; bids closed Mar. 11.

248 tons, bridge, proj. W2F1, Vandalia, Ill., for State Highway Department; American Bridge Co., Pittsburgh, low; bids Mar. 5.

150 tons, Humptulips river bridge, Washington; bids to Public Roads Administration, Portland, Oreg., March 17; materials furnished by government.

150 tons, plant addition, Charis Corp., Allentown, Pa.; bids asked.

115 tons, Clackamas river bridge, Oregon; bids to Public Roads Administration, Portland, Oreg., Mar. 17; materials furnished by government.

Unstated, railroad bridge, Deschutes project, Oregon; bids to Bureau of Reclamation, Mar. 16.

## REINFORCING BARS . . .

### REINFORCING BARS PLACED

650 tons, second pier, Mystic bridge, Boston, to Bethlehem Steel Co., Bethlehem, Pa.

400 tons, office building, Walgreen Co., Chicago, to Ceco Steel Products Corp., Cicero, Ill.; Sumner S. Sollitt & Co., Chicago, contractor.

400 tons, flood wall, Omaha, for U. S. Engineer, to Sheffield Steel Corp., Kansas City, Mo., through Construction Products Co.; Parsons Construction Co., Omaha, contractor.

400 tons, Claghorne public school, Philadelphia, through Ralph S. Herzog, that city, to Bethlehem Steel Co., Bethlehem, Pa.

300 tons, building, Mary Knoll College, Glen Ellyn, Ill., to Joseph T. Ryerson & Son Inc., Chicago; W. E. O'Neil Construction Co., Chicago, contractor.

300 tons, miscellaneous construction projects, to Bethlehem Pacific Coast Steel Co., Seattle.

125 tons, municipal building, Evanston, Ill., for city, to Olney J. Dean Steel Co., Chicago; Peter Hamlin Construction Co. Inc., Chicago, contractor.

### REINFORCING BARS PENDING

8500 tons, Hungry Horse dam, Coram, Mont., for U. S. Engineer; bids Apr. 1.

3350 tons, tunnels and appurtenances, Blakely Mountain dam; Mar. 25, U. S. District Engineers, Vicksburg, Miss., inv. 322.

2000 tons, approximately, buildings, Logan airport, Boston.

1000 tons or more, $5 million public safety building, Seattle; bids expected in May.

850 tons, veterans' hospital, Spokane, Wash.; bids to U. S. Engineer, Mar. 18.

700 tons, Washington State College library;

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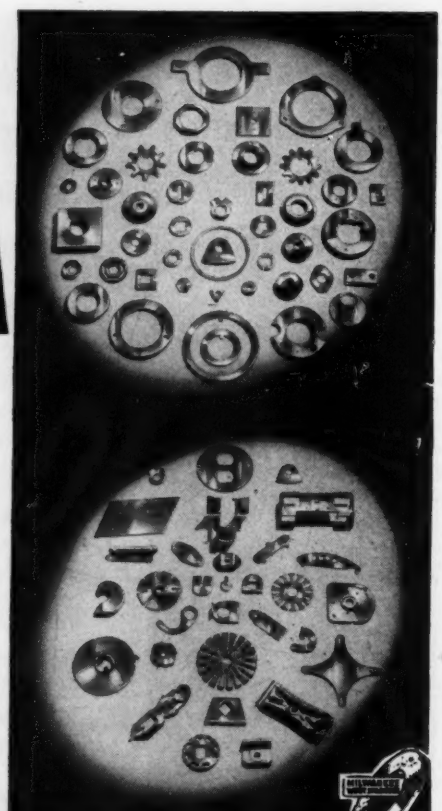

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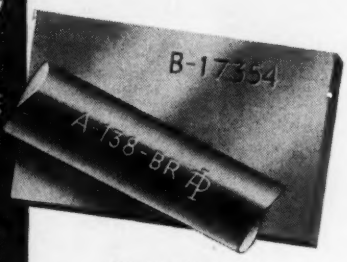


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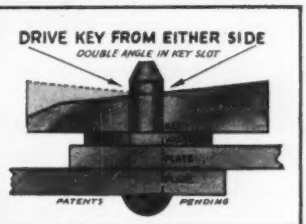


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Kuney-Johnson Co., Seattle, low $2,382,390.

500 tons or more, addition to veterans hospital, Portland, Oreg.; Del E. Webb Construction Co., Los Angeles, low $2,593,952.

225 tons, factory building, Radio Corp. of America, Lancaster, Pa.; bids Mar. 24.

175 tons, municipal stadium, Atlantic City, N. J.; bids Mar. 18.

## PLATES . . .

### PLATES PLACED

306 tons, penstock, spec. 2066, Yakima, Wash., for Bureau of Reclamation, Denver, to American Pipe & Construction Co., Los Angeles.

300 tons, five flood gates, spec. 1983, Oral, S. Dak., for Bureau of Reclamation, Denver, to Virginia Bridge Co., Roanoke, Va.

138 tons, 108-inch pipe, Wild Spur, Colo., for Bureau of Reclamation, Denver, to Southwest Welding & Mfg. Co., Alhambra, Calif.

## PIPE . . .

### CAST IRON PIPE PENDING

150 tons or more, housing project Mercer island, Seattle; bids soon, alternatives.

### STEEL PIPE PENDING

Unstated, 4300 feet 20 inch; bids to D. Wiley Carpenter, city clerk, Longview, Wash., Mar. 25; Stevens & Koon, Portland, Oreg., engineers.

## RAILS, CARS . . .

### RAILROAD CARS PLACED

Atchison, Topeka & Santa Fe, 47 lightweight passenger cars, to the St. Charles, Mo., shops of American Car & Foundry Co., New York.

Chicago, Rock Island & Pacific, 500 seventy-ton hopper cars, to St. Louis shops of American Car & Foundry Co., New York.

Pacific Fruit Express Co., 3000 refrigerator cars, to own shops.

Union Pacific, 50 chair cars to Pullman-Standard Car Mfg. Co., Chicago, and 50 sleeping cars to the Budd Co., Philadelphia.

Wheeling & Lake Erie, 500 seventy-ton gondolas, to the American Car & Foundry Co., New York, for construction at the company's St. Louis plant.

### RAILROAD CARS PENDING

Erie, 30 all-steel baggage and express cars, bids asked.

Norfolk & Western, 1000 seventy-ton steel cars; bids asked.

St. Louis-San Francisco, 50 gondolas, contemplated.

### LOCOMOTIVES PENDING

Chicago, Rock Island & Pacific, 59 diesel-electric locomotives, of which 34 have been placed with the American Locomotive Co., New York, and the remainder with the Electro-Motive Division, General Motors Corp., La Grange, Ill.; those to be built by American Locomotive Co. comprise twenty-four 1500-horsepower freight locomotives, five 1000-horsepower switchers, and five 1500-horsepower road switchers; those to be built by Electro-Motive comprise ten 4500-horsepower freight locomotives, ten 1000-power branch-line locomotives.

Louisville & Nashville, 22 steam locomotives of the 2-8-4 type to the Lima-Hamilton Corp., Lima, O., and 39 diesel-electric locomotives, as follows: five 1000-horsepower switchers, five 1500-horsepower auxiliary locomotives and four 2000-horsepower passenger locomotives to the Electro-Motive Division, General Motors Corp., La Grange, Ill.; and twenty 660-horsepower and five 1000-horsepower switch engines to the American Locomotive Co., New York.

Minneapolis, St. Paul and Sault Ste. Marie, one 1000-horsepower diesel-electric switcher and four 4500-horsepower diesel-electric freight engines, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

# CONSTRUCTION AND ENTERPRISE

### CALIFORNIA

LOS ANGELES—Republic Supply Co., 2122 E. Seventh St., has awarded an $800,000 contract to Griffith Co., 1060 S. Broadway, for construction of a warehouse and office.

VERNON, CALIF.—Areo Die & Stamping Co. will build a $70,000 building at 2730 E. 37th St. Engineer is David R. Edwards, 5911 Pine Ave., Maywood, Calif.

### CONNECTICUT

BRIDGEPORT, CONN.—United Illuminating Co., 1115 Broad St., has awarded a $394,000 contract to Gellatly Construction Co., 181 Sylvan Ave., for erection of a power plant addition.

DANIELSON, CONN.—Arrow Hart & Hegeman Electric Co., 103 Hawthorne St., Hartford, has awarded $68,000 contract to Coleman Construction Co., 49 Westminster St., Providence, R. I, for the erection of a boiler plant.

### DELAWARE

CLAYMONT, DEL.—Worth Steel Co. has awarded a $70,000 contract to Ft. Pitt Bridge Works, Keystone Hotel, Pittsburgh, for construction of a structural steel shop.

### ILLINOIS

RIVER GROVE, ILL.—Reynolds Electric Co., 2650 Congress St., has awarded a general contract to Continental Construction Co., 340 N. Central Ave., for construction of a 1-story factory. Project will cost about $170,000.

### INDIANA

FT. WAYNE, IND.—U. S. Rubber Co., 4300 New Haven Ave., plans to remodel a plant here at a cost of $75,000.

### KENTUCKY

CALVERT CITY, KY.—Pennsylvania Salt Mfg. Co., Widner Bldg., Philadelphia, has awarded a $3 million contract to Early Construction Co., 321 Middle Waterway, Tacoma, Wash., for the erection of fluorine chemical plant, including shop and administration buildings.

### MINNESOTA

ST. PAUL—International Harvester Co., 180 N. Michigan Ave., Chicago, plans to build a $1 million parts depot at Franklin Ave. and Eustis St.

### MISSOURI

LAMAR, MO.—Hutchens Metal Products Co. proposes to build a $125,000 plant for the manufacture of farm wagons and implements.

ST. LOUIS—Monsanto Chemical Co., 1700 S. Second St., has awarded a $300,000 contract to Gamble Construction Co., 804 Pine St., for erection of a mechanical shop at 112-120 Russell Ave.

### NEW YORK

LONG ISLAND CITY, N. Y.—Broadway Maintenance Corp., 47 35th St., has awarded a $425,000 contract to D. & A. Construction Co., 965 Home St., New York, for erection of a factory.

### NORTH CAROLINA

WILMINGTON, N. C.—Southland Mfg. Co., c/o Charles C. Hartmann, architect, Jefferson Bdlg., Greensboro, has awarded a $100,000 contract to W. A. Simon, 309½ Marstellar St., for construction of a plant addition.

### OKLAHOMA

JACKSON COUNTY, OKLA.—Stanolind Pipe Line Co., Stanolind Bldg., Tulsa, has awarded a $186,000 contract to R. H. Fulton & Co., Lubbock, Tex., for installation of 5500 ft of crude oil pipeline across the Salt Fork of Red River in this and Green counties.

### PENNSYLVANIA

LIBRARY, PA. — Pittsburgh Consolidation Coal Co., Pittsburgh, will soon begin construction of a pilot plant here at a cost of $300,000, to convert coal into gasoline, fuel oils and gas. If the model plant is practical, firm will erect a $120 million big-scale plant, to be in operation by 1951 at the latest. Esso Standard Oil Co. and Hydrocarbon Research Inc. are co-operating on the project.

MIDLAND, PA.—Crucible Steel Co., 30 E. Smallman St., Pittsburgh, has awarded an $800,000 contract to Rust Engineering Co., Clark Bldg., Pittsburgh, for construction of a boiler plant addition.

PHILADELPHIA—John B. Stetson Co., Fifth and Montgomery Ave., has awarded a $70,000 contract to John A. Robbons Co. Inc., Fuller Bldg., for boiler plant improvements, modernization and replacement.

YORK, PA.—International Chain & Mfg. Co., 459 Norway St., plans to build a $100,000 warehouse and storage building.

### TEXAS

COTTLE COUNTY, TEX.—Stanolind Pipe Line Co., Stanolind Bldg., Tulsa, Okla., has awarded a $116,000 contract to R. H. Fulton & Co., Lubbock, for installation of 1800 ft of crude oil pipeline crossing the North Pease River.

DALLAS, TEX.—Daniel Auto Radiator Mfg. Co., c/o Wyatt C. Hedrick, architect, 904 Ft. Worth Ave., will build a $125,000 industrial building.

EDNA, TEX.—Magnolia Pipe Line Co., 1009 Fanin St., Houston, has awarded a $145,000 contract to Atgilt Construction Co. for installation of a 10-mile crude oil pipeline in the Edna area.

HOUSTON, TEX. — Humble Oil & Refining Co., Harry C. Wiess, president, plans an oil drilling program costing approximately $65 million.

HOUSTON, TEX.—Southwestern Bell Telephone Co., 1121 Capitol St., has awarded a $100,000 contract to W. S. Bellows Construction Co., 716 N. Everton St., for erection of a 2-story storage building.

TEXAS CITY, TEX.—Republic Oil Refining Co. has purchased an aviation gasoline plant here and will spend $250,000 for repairs, restoration and rehabilitation of the refinery.

WITHERS, TEX.—Texas Co., Texas Bldg., Houston, has awarded a $390,000 contract to Brown & Root Inc., 4300 Calhoun Rd., Houston, for construction of a compressor plant.

### CANADA

NICOLA, B. C.—Guichon Mines Ltd., New Toronto, Ont., has awarded a $78,800 contract to Boyle Bros. Drilling Co. Ltd., c/o owner, for a minimum of 6000 ft of diamond drilling.

CHAMBORD, QUE.—Canadian National Railroad, B. Wheelwright, chief engineer, 360 McGee St., Montreal, will spend $150,000 on reconstructing 100 miles of track between here and Chicoutimi.

MONTREAL, QUE.—Howard Air Conditioning Ltd., 2100 Girouard Ave., will build a $150,000 foundry at Montee St. Lourent near here.

THETFORD MINES, QUE.—Asbestos Corp. Ltd., Canada Cement Bldg., Montreal, and Quebec Central Railway, 89 Wellington St. W., Sherbrooke, have awarded a $400,000 contract to Frank Ross Constructors Ltd., 736 Cote St. Catherine Rd., Outremont, for railway diversion work.

### COLOMBIA

BOGOTA, COLOMBIA—Instituto de Fomento Industrial, governmental agency in charge of industrialization, has named H. K. Ferguson Co., New York and Cleveland, to design and construct additional alkali plants in the Bogota area.